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ADDRESSES AND ORIGINAL ARTICLES

ON COMPLICATIONS OF THE SPECIFIC FEVERS

WITH ESPECIAL REFERENCE TO SCARLET FEVER AND MEASLES *

BY CHARLES R. BOX, M.D., F.R.C.P. LOND., F.R.C.S. ENG.

SENIOR PHYSICIAN TO THE LONDON FEVER HOSPITAL, AND TO THE FREEMASONS' HOSPITAL; CONSULTING PHYSICIAN TO ST. THOMAS'S HOSPITAL

II.—THE RESPIRATORY LESION

OF infectious diseases which are characterised by inflammations of the respiratory tract, measles, whooping-cough, and influenza stand in a group by themselves. With measles, particularly, death from any other cause than broncho-pneumonia is exceedingly rare.

A moderate degree of laryngeal and bronchial catarrh is so common in measles as to be considered a part of the ordinary attack. When the initial catarrh falls with especial force upon the larynx, particularly in young children, it gives rise to diagnostic difficulties with which all fever hospital officers are familiar. The croupy cough and laryngeal spasm at once raise suspicions of laryngeal diphtheria, and the danger of admitting such a case to a diphtheria ward, with lamentable results, has always to be guarded against. Appreciation of the significance of Koplik's spots on the mucous membrane of the cheeks, before or with the appearance of the measles rash, has lessened the difficulty of differential diagnosis, and bacteriological examination of a swab taken low down with, latterly, the possibility of direct examination of the larynx lend assistance to the detection of diphtheria. Doubtful cases should be isolated. It is most undesirable and hardly ever necessary to perform a tracheotomy for the laryngitis of measles. A steam tent and careful nursing will, almost without exception, lead to a successful result.

During the eruptive period of measles laryngitis may also develop and may prove rather persistent. Usually it is catarrhal only, and gives rise to hoarseness or aphonia and an irritating cough. As a rule it clears up satisfactorily in a week or two, but sometimes shallow ulceration of the arytenoid region and vocal cords supervenes, in which case the condition is more persistent, and dysphagia and suffocative sensations may be added to the other symptoms. Rest of the larynx and benzoin inhalations usually lead to complete recovery. Needless to say, even in such cases the possibility of a diphtheritic infection should be excluded with care.

Laryngitis occurring for the first time during convalescence from measles is usually diphtheritic, and in debilitated and ill-nourished children was formerly responsible for a fearful mortality. I can remember one such epidemic in the winter months before antitoxin was available, and it made an impression which I shall never forget.

Bronchiolitis and Broncho-pneumonia

In measles a complicating broncho-pneumonia usually makes its appearance in the eruptive stage or shortly afterwards, but there has been recognised, particularly by the French physicians, a suffocative catarrh which occurs as a precocious complication at the very onset of the malady either before or simultaneously with the earliest appearance of the eruption. This catarrh is sudden and unexpected in its development and of extreme gravity. According to Trousseau it may attack both infants and adults. It is characterised by an abrupt rise of temperature, incessant cough, and great dyspnœa. Many râles, both crepitant and bubbling, are heard in the lungs, and in the adult there is copious frothy or mucopurulent expectoration. The patient is in a condition of semi-asphyxia, and cyanosis quickly supervenes. The facies is anxious, the pulse is thready, and the extremities are cold. The eruption may be very ill-developed, late in appearance, or retrocedent. The highly infectious nature of the malady may be missed. Death may occur within a week, sometimes much sooner. Should the patient recover, broncho-pneumonia will follow. The condition is one of acute widespread capillary bronchitis, and is thought to be caused not by complicating organisms but by an extension of the true measles infection to the whole pulmonary field. It has never been my lot to see a case which conforms exactly to this description, but on several occasions, in children at the very onset of the rash, I have seen a very intense dyspnœa which, although threatening a broncho-pneumonia, subsided rapidly as the rash became fully developed. Those of us who remember the influenza epidemic at the end of the war cannot fail to recognise how closely some of the grave cases approximated to the lung condition described above.

Much more common than this suffocative bronchiolitis of onset is the broncho-pneumonia which supervenes in the eruptive period or which closely follows it. The advent of this complication should be suspected if the temperature fails to fall as it should after the full development of the rash and the respirations remain rapid and the pulse-rate fast. Distinct signs of pulmonary consolidation may be absent in the earliest stages; only the usual signs of bronchitis may be present, and the percussion note may be hardly if at all impaired. Sooner or later, usually posteriorly and over the lower lobes of the lungs or near the lung roots, small areas of crackling crepitus may be detected. These are especially suggestive when the crepitus is both inspiratory and expiratory in rhythm. Later still, the breath sounds may become bronchial or tubular in quality, and areas of percussion dullness be detected.

Rather different in type is the condition described by P. Nobécourt and J. Lereboullet as acute œdema of the lungs, which they hold is often confused with hyper-acute broncho-pneumonia. This condition usually appears at the acme of the disease (second day of eruption) and at times a few days later, and is most prevalent in those seasons when respiratory troubles are rife. Râles are audible over both lungs. Dyspnœa is urgent, with cyanosis, the pulse-rate is quick, and the temperature rising. The sputum is frothy, and death may occur either from asphyxia or heart failure. These authors consider it most likely that an œdematous and an inflammatory condition coexist, and they say that it is possible that the affection may be entirely due to measles or caused by secondary invaders. There is little beyond the time of onset to differentiate this condition from that described by Trousseau.

* The Lumleian lectures for 1933, delivered before the Royal College of Physicians of London on March 16th, 21st, and 23rd. Lecture I. on the Vascular Lesion appeared in our issue of June 10th, and Lecture III. will appear in a forthcoming issue.

In another type of case the eruptive fever falls by the usual crisis or rapid lysis, but a re-accession occurs after a short interval, accompanied by rapidly rising pulse- and respiration-rates, and the signs of broncho-pneumonia as described above. In favourable cases the condition may subside within a week or ten days, but this is not always the case, and a prolonged illness lasting weeks or even months may ensue. This is said to be seen in weakly, rachitic, and ill-nourished children, but several times I have known it in children otherwise healthy and brought up under the best conditions. It is not unknown in adults. The temperature chart may assume a markedly remittent form which, with pallor and sweating, often gives rise to unfounded suspicions of tuberculosis, but no tubercle bacilli are found in the sputum and the condition may ultimately clear up; not always, however, for there is the strongest evidence that bronchiolectasis and fibrosis of the lung as seen in childhood more often owe their origin to the broncho-pneumonia of measles and whooping-cough than to any other infection. The following is a striking example of this type of broncho-pneumonia.

A young man of 23 years was admitted to the London Fever Hospital with a well-developed measles rash of two days' duration. The rash had been rather tardy in its appearance and was not seen until the sixth day of the illness, which was characterised by malaise, coryza, sneezing, and cough. The fauces were inflamed and Koplik's spots present on the buccal mucosa. The temperature remained about 104° F. for two days as the rash developed and then rapidly fell to normal, but after two days' apyrexia the temperature quite suddenly rose to 104° F. and the pulse-rate to 120. The respirations were rapid, but at first no changes could be detected in the lungs; then the percussion note over the right upper lobe became impaired both in front and behind, the breath sounds assumed a bronchial quality, and a few crepitations were audible on deep breathing. These signs gradually extended to the base of the lung, which finally became so dull as to suggest the presence of fluid. Insertion of an exploring needle, however, showed that the lung was solid. After being more or less sustained for a week, the fever assumed an oscillating type, normal in the morning and rising to 101°, 102°, or 103° F. at night, with much sweating (Fig. 2). The pulse- and respiration-rates were rapid throughout. Examinations of the sputa for tubercle bacilli were negative. This type of fever continued for over five weeks, and for practically the whole of this time the patient was nursed on a balcony. The lung cleared slowly from the apex downwards, and at the end of this time there was still some impairment of note at the right base, but the lung was expanding well with good air entry. The crepitations had disappeared, there was no cough, and the night sweats had now ceased, but the patient complained of slight pain on the right side of the chest. This pain disappeared after a summer's convalescence.

I had the opportunity of examining this patient nine years after his illness. He told me that two years previously he had been passed for insurance as a first-class life. The only abnormality I could discover was that the measurement and expansion at the base of the right lung was slightly less than on the left side. He looked robust and complained of nothing. There was no cough and no sputum. Dr. Fildes took a radiogram of his chest for me; the plate shows absolutely no abnormality.

Other pulmonary complications in measles are exceptional. Lobar pneumonia has been described, and also massive collapse of the lung. Pleural effusions, which sometimes are purulent, may be met with, and are said to be more common in some epidemics than in others.

Interstitial and Subcutaneous Emphysema

An event which, although rare, is of some interest both in measles and in whooping-cough, is the supervention of emphysema of the interstitial tissue of the lung and also of the mediastinum and the subcutaneous tissues. When limited to the lung tissue it is not likely to be detected clinically, but when it extends to the mediastinal tissues it may be recognisable, and when it overflows to the subcutaneous tissues its presence is unmistakable. The following is a remarkable instance of this complication.

A boy of 5½ years became feverish and poorly one evening, and remained in bed next day. On the third day his temperature was 103° F., the eyes were injected and watering, cough was troublesome, and he was intolerant of light. On the fifth evening a measles rash appeared on the face, temples, and neck, spreading later to the chest, arms, and abdomen. The temperature was now 104° F., the respirations were hurried and shallow, and the pulse quick and soft. The child was slightly delirious and cough was incessant. On the sixth day the neck was noticed to be puffy, and on the next day the swelling had increased in the neck and spread to the maxillary region; the left side swelled first but the right side quickly followed. His appearance gave the impression of mumps. During the succeeding days the swelling gradually extended to the chest and back, arms, abdomen, and thighs. The scrotum became hard, and swollen to the size of a cricket ball. There was much difficulty in passing water. The cough continued and the temperature varied from 100° to 102° F. At the end of the first fortnight I saw the patient with Dr. Allan Swallow, to whom I am indebted for the notes of the case. The swelling was extensive and crackled on palpation, evidently a subcutaneous emphysema. The cough was still troublesome and respirations were rapid. We assumed a broncho-pneumonia, but owing to the emphysema auscultation was difficult. The boy's condition mended gradually, but the abdomen and scrotum did not become normal for several weeks. I saw him again about seven weeks from the commencement of his illness and found that all the emphysema had disappeared and the lungs seemed to be normal.

Emphysema of the interlobular connective tissue is unlikely to be detected unless, as rarely happens, pneumothorax supervenes by further rupture. When emphysema reaches the lung root and spreads into the mediastinal connective tissue, there is one contingency which merits attention: mediastinal emphysema around the pericardial sac may give rise to sounds which mimic pericardial friction, and may be mistaken for pericarditis. When the overflow reaches the subcutaneous tissues a crackling crepitus is heard when the stethoscope is applied, but palpation at once shows the true state of affairs. As a rule the sequence of events is that in the case I have just related; the air is completely absorbed and recovery takes place.

The Production of Pulmonary Fibrosis

The important part played by the broncho-pneumonia of measles and of whooping-cough in the production of pulmonary fibrosis and bronchiectasis is hardly sufficiently appreciated. My attention was forcibly drawn to this point when in charge of the children's department at St. Thomas's Hospital. A perusal of Clarke, Hadley, and Chaplin's book on "Fibroid Diseases of the Lung" (London, 1894) was illuminating, and the publication by Theodore Fisher in 1903 of five cases of dilatation of the bronchial tubes after measles lent additional stimulus to the investigation. Fisher rightly said: "It is only when chronic or subacute pulmonary trouble dates from an attack of measles and dilatation of the bronchial tubes is found that we can definitely attribute to measles any share in the causation of the dilatation." And Hans Vogt points out the difficulty in getting a reliable history in the later stages of a disease of such long duration as bronchiectasis, especially in children of the poor. "Often too," he says, "there have been several illnesses each one of which might be considered a sufficient cause, so that selection is impossible."

I have notes of 42 cases of pulmonary fibrosis which were under my care or came under my observation at St. Thomas's Hospital. A few were in-patients

but most of them attended my out-patient department. Special care was taken in an attempt to elucidate the cause, and also to exclude cases of tuberculosis by radiological examination and repeated examinations for tubercle bacilli, and by the use of Calmette's and of Pirquet's tuberculin tests. Lipiodol was not available at the period when the observations were made.

Of the 42 cases, measles accounted for 14, whooping-cough for 6, measles and whooping-cough combined for 9, and the origin was doubtful or not traced in 13. That is to say, more than two-thirds were definitely established to be the result of pulmonary inflammation following measles or whooping-cough—a very striking proportion. The localisation of the lesion was left-sided in 28, right-sided in 9, and bilateral in 5. It was usually basal. The condition preponderated in females, the numbers being females, 22; males 12; and sex not recorded 8. It would be of great interest to know in what percentage the broncho-pneumonia following measles and whooping-cough becomes chronic.

Of 45 cases collected by Sir Andrew Clark and his collaborators, 33 patients attributed their disease to an attack of measles or whooping-cough or both, occurring in early life and complicated by chest affections. This is exactly two-thirds again. The distribution was left-sided in 25, right-sided in 15, and bilateral in 5. These authors met with the largest number of cases between 5 and 15 years, and concluded from their figures that the greater number probably succumbed before 30 years of age. (Most of my cases were met with in children of from 1–10 years.)

Clive Riviere has also written on this subject, and of 33 cases of fibrosis of the lung which he collected whooping-cough accounted for 8, measles for 3, and whooping-cough and measles combined for 2, a little over one-third in all. He found the condition twice as common on the left as on the right side, with a tendency to involve the whole lung or the base only. He agrees that sacculation of the tubes is present, but appears to think that it only occurs when fibrosis is considerable. He attributes apical cases mostly to lobar pneumonia. He thinks that an untreated pleurisy may lead to fibrosis, but less frequently than is commonly supposed.

It is interesting, also, to compare the results of Prof. L. Findlay and Dr. S. Graham, who had the advantage of lipiodol injection to clinch their diagnoses. Of their 23 cases, all in children under 13 years of age, 13 were females and 10 males; 14 of the cases were left-sided, 4 right-sided, and 5 bilateral. All but 3 originated in acute pulmonary diseases, but infectious diseases are fewer than has been found by other authors—i.e., measles 2, whooping-cough 2, measles and whooping-cough combined 2, roughly a quarter—but these authors go on to say that in a large proportion of recorded cases the ætiological broncho-pneumonia is secondary to measles or whooping-cough. They think the pulmonary fibrosis and pleural adhesions play a chief part in the causation of bronchiectasis, although they find that the chronic pneumonia is not invariably accompanied by dilatation of the bronchial tubes. Also, they found that bronchiectasis might be present and demonstrated radiologically without any distinctive clinical signs of its existence.

Thus, at the best, two-thirds of the cases of bronchiectasis and fibrosis of lung can be traced to the broncho-pneumonia of measles and whooping-cough, or to the two diseases in combination. The chronic lesion is three times as common on the left side as on the right, usually involving the lower lobe, sometimes the whole lung. Bilateral occurrence is known but is not the rule.

Clinical Features of Fibrosis and Bronchiolectasis

On several occasions I have had the opportunity of tracing bronchiolectasis during its development from an attack of broncho-pneumonia. In such cases the crepitations gradually become larger, louder, and more crackling, whilst the bronchial breath sounds assume a slight amphoric quality, corresponding to an early cavity formation found at autopsy. But in these early stages diagnosis is often a matter of inference rather than a certainty. More often my patients have come under observation for obstinately recurrent and paroxysmal cough with, it may be, successive febrile attacks. Where a history like this is obtained after an infectious fever, or where relapsing pneumonic processes occur as sequels to protracted broncho-pneumonia, bronchiolectasis and fibrosis should be suspected, although at this time the chest may not be retracted, the sputum not significantly increased or fœtid, and signs of cavity formation lacking. In some of these cases little may be found beyond some slight impairment of the percussion note, usually basal, with absence or roughening of the breath sounds. Often there is slight restriction of the chest movements on the affected side. In some cases, however, the expectoration of a little thick purulent sputum, if this can be induced by inversion or otherwise, will produce an astonishing and apparently quite disproportionate change in the physical signs in the affected lung. The breath sounds may assume an amphoric quality, the voice sounds become increased, and a volley of consonating crepitus appears where before signs were absent. The temporary blockage of a bronchus is the explanation of such cases. Where bronchial breathing and crepitation tend to appear and disappear in certain areas of the lung without evidence of fresh infection and in the absence of fever, the same explanation applies. In children, complete inversion with encouragement of cough is the best method of eliciting the characteristic signs, and also of obtaining sputum for bacteriological examination.

Radiological examination, especially after lipiodol injection, is capable of giving very useful information as to the condition of the lung.

In the advanced stage of the disease the affected side of the chest is contracted, usually at the base, and its respiratory mobility greatly impaired. If the tubes are full of secretion or the main bronchus blocked, vocal fremitus is absent; otherwise it is present or increased. The percussion note is dull. Breath sounds, when audible, are bronchial, tubular, amphoric, or even cavernous, but absent if no air is gaining access to the damaged lung. Similarly the spoken or whispered voice may be conducted excessively or annulled. The diaphragm is often raised to such an extent that on the left side gastric resonance may extend high into the axilla and on a superficial examination be mistaken for resonant lung. The heart is uncovered, and its displacement towards the fibroid lung may be extreme. In left-sided disease it is not uncommon to find the cardiac impulse near the posterior axillary fold. Cyanosis is the rule, and also clubbing of the fingers; sometimes hypertrophic pulmonary osteo-arthropathy supervenes and also lardaceous disease. Patients who happen to have been examined when the tubes were blocked have on several occasions in my experience been explored for empyema, mostly by aspiration but sometimes even by rib resection; one only

saved himself by voiding the purulent contents of the chest whilst being anæsthetised. The recurrent febrile exacerbations have often led to a diagnosis of repeated attacks of pneumonia, the true underlying condition being overlooked. Many are erroneously considered to be suffering from tuberculosis.

Where bronchiectasis is a marked feature the sputum may become more copious and even fœtid as time goes on. This is more likely to occur in early adult life than in childhood. At the latter age-period the classical three-layered sputum is quite exceptional. Recurrent hæmoptysis, which may be considerable in quantity, occurs in some cases. This again is exceptional in childhood.

I have mentioned the conclusion reached by Sir Andrew Clark: that most of these patients did not live to 30 years of age, but I know of one in whom, after development of an extreme degree of contraction of the chest, the condition became quite quiescent and, although the patient was dyspnœic, the lungs became dry and there was no sputum.

A radiographic examination was made in most of my cases. The amount of information obtained as to the condition of the lung varied much in different cases. A great deal depended on the amount of pus present in the tubes. Examinations before the tubes were emptied tended to show a dense shadow on the affected side. In one instance the shadow was so dense that it completely obscured the outline of the heart and diaphragm. After inversion and expectoration of over an ounce of tenacious greenish pus, the shadow lightened up and, although there was still an opacity, the cardiac outline could now be recognised; it was drawn over towards the affected side and the dome of the diaphragm could also be distinguished in an elevated position. In another patient who at times expectorated nearly 2 oz. of blood-stained pus, examination when the tubes were empty failed to reveal any opacity at all, although the ordinary physical signs of fibrosis and bronchiectasis were well marked. Of late years we have had at our disposal the method of intratracheal lipiodol injections. This gives much better information, and is fully described with most instructive illustrations by Prof. Findlay and Dr. Graham.

An illustrative case of the type I have been describing was watched to its termination at St. Thomas's (and is quoted by R. E. H. Leach in his Oxford graduation thesis). Briefly, the history of this patient was as follows: Pulmonary trouble supervened on an attack of measles and whooping-cough when he was quite a young child, and persisted with cough, expectoration, and occasional hæmoptysis. As the lad grew up, his expectoration became more copious and offensive, being voided three or four times a day in considerable quantity. The expectoration was brought on by changing posture, especially by stooping. On several occasions hæmoptysis amounted to 3 or 4 oz. At the age of 19 the condition was as follows. The left side of the chest was immobile and the percussion note impaired, becoming absolutely dull at the lung base. The cardiac impulse was evident far back in the left axilla. Cavernous breathing, pectoriloquy and coarse metallic crepitations were audible near the angle of the left scapula. The fingers were clubbed, the knees and wrists were swollen, and the urine was albuminous. From 10 to 20 oz. of blood-stained purulent sputum were brought up every day. Despite this, the patient was afebrile, gained weight and slowly improved. Ultimately, after a few days' headache, a left hemiplegia developed, and a fœtid abscess was evacuated from the right motor area of the brain. Death occurred ten days later; he was then 20 years old.

An autopsy was allowed and the left lung was found to be retracted, adherent to the parietes and to the pericardium, fibroid and bronchiectatic. The bronchiectasis was both cylindrical and saccular. Dilated bronchioles could be traced even to the pleural envelope, where they communicated with cavities which were lined with ragged epithelial tissue. The right lung was extremely emphysematous. There was no trace of tuberculosis. A more complete example of the condition we are considering could hardly be obtained.

Pathological Characters

An accurate knowledge of the histological characters and mode of spread of the lung inflammation in measles and whooping-cough in common with other infectious maladies, particularly influenza, throws a flood of light on the pulmonary complications which are so characteristic of these diseases.

The terminal or lobular bronchioles expand into cavities which are known as atria, or alveolar passages, a short vestibule intervening. The atria in turn give off a number of blind and irregularly funnel-shaped diverticula which are known as infundibula or air sacs. These are completely beset with shallow air cells. Thus the infundibula do not communicate directly with terminal bronchi, for between each infundibulum and its feeding bronchiole is the expansion of the latter which forms the vestibule and atrium. The atria may be distinguished from terminal bronchioles by the absence of smooth muscle-fibres in their walls and by the character of their lining epithelium, which is a flattened pavement, instead of being short columnar, and ciliated as in the bronchiole. Radiography has suggested that there may be a sphincter action between bronchiole and atrium. The diameter of an atrium is rather more than half that of the terminal part of an infundibulum and, unlike an infundibulum, each atrium has several openings, one of which is the vestibular opening of the bronchiole and the other two or three are entrances to the infundibula. An infundibulum, on the other hand, has only one opening, its communication with an atrium. The minute air cells of the lung occur sparsely on the walls of the bronchioles, but form the whole circumference of the atria and infundibula. The small polygonal areas visible to the naked eye beneath the visceral pleura correspond to groups of infundibula projecting against its deep surface.

Instead of being a spread of infection within the bronchial tubes to the alveoli of the lung, the true broncho-pneumonia of measles originates in a peri-bronchiolitis with inflammation of the interstitial tissue as a predominant feature. The fibrous coats of the bronchioles with their vessels are particularly involved, with consequent swelling and intense vascular engorgement. This peri-bronchiolitis is accompanied on the one hand by endo-bronchiolitis, desquamation, and exudation into the airway, and on the other by spread of inflammatory infiltration into the supporting septa of the lobule, forming nodules of peri-bronchiolar pneumonia (see Fig. 1). The interstitial inflammation spreads in various directions from these foci, implicating the adjacent air sacs in its course. The origin of the inflammation is therefore peri-bronchial and not truly broncho-pneumonic as seen in an aspiration broncho-pneumonia. In fact, it has been likened to the spread of an erysipelatous cellulitis spreading from the peri-bronchial tissue into the stroma of the lung. The extension of the interstitial inflammation into the lobule surrounds the air sacs and is followed by an exudation into these. This process continues until the boundaries of the lobules are reached. The alveoli situated immediately on the bronchioles contain, in some cases, a fibrinous exudate, whilst in the distal or peripheral alveoli the exudate is mainly cellular. The primary inflammation of the bronchioles is scattered and leads to all degrees of bronchitis and bronchiolitis: a simple inflammation with hyperæmia and epithelial desquamation; a more extensive round-celled infiltration with dilatation and destruction of the bronchiolar walls; or even a process of necrosis leaving a cavity surrounded by inflammatory exudate which in turn is surrounded by adjacent consolidated alveoli. In some of the cavities the lining epithelium can be still recognised. In some cases even to the naked eye the destruction of the bronchioles may show itself as a pitted or excavated appearance of the cut surface of the consolidated lung.

The obstruction of the bronchi produces an emphysema of the air sacs which they feed, and thus are

generated small air-containing bullæ, sometimes evident on section and sometimes seen on the surface of the lung beneath the pleural envelope. This latter distribution distinguishes them from bronchiolectases; the condition, although often known as bronchiolectasis, is something more than the latter term implies. It is easy to see how interstitial emphysema may originate from rupture of an over-distended or inflamed vesicle and extend to the mediastinal and subcutaneous tissues. In cases where obstruction of the small air-tubes is complete, lobular collapse, which is so common in bronchopneumonia, will follow. By some authors the bronchiectasis of measles and whooping-cough is looked upon as a complication induced by the incessant coughing and the associated catarrh of the air-passages which may be due to a secondary infection; but it seems more probable that the condition is the outcome of the bronchiolar inflammation which exists from the very commencement of the lung involvement in these diseases.

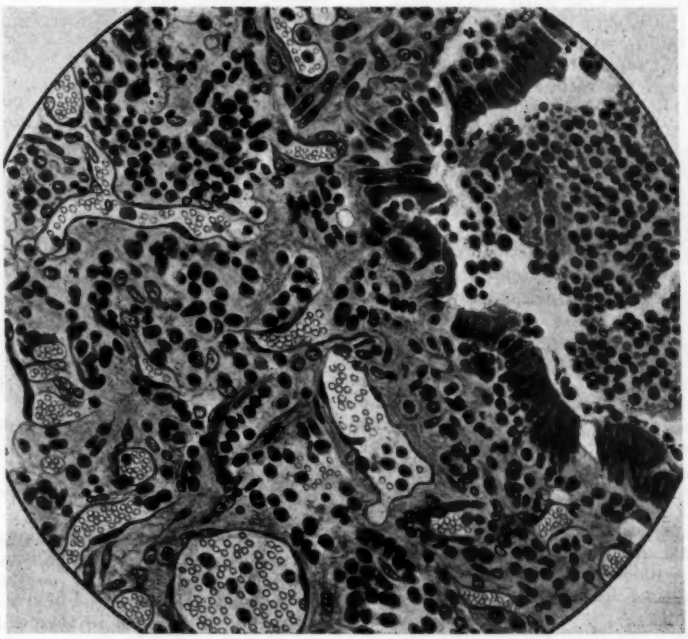

FIG. 1.—Lung in early measles. Acute bronchiolitis, intense peri-bronchial congestion, and direct invasion of contiguous alveoli. The inflammatory exudate is everywhere and characteristically round-celled. (From a patient who died in St. Thomas's Hospital.)

Pathological evidence confirmatory of the clinical observation that inflammatory lung changes may appear at the first onset of measles is afforded in a paper by J. Denton entitled The Pathology of Fatal Measles, and based on cases seen in an epidemic in the canal zone of Panama. Amongst others Denton examined three early cases in which death occurred 3 hours, 18 hours, and 24 hours after the appearance of the rash. In these early cases the affected lungs were voluminous, small petechiæ were present under the visceral pleuræ, and the lungs on section were already mottled with red or even greyish areas of peri-bronchial inflammation, while the bronchioles contained a little pus. In many of the smaller bronchial radicles the epithelium was raised from its basement membrane of connective tissue by collections of leucocytes and pus cells. Long tags of well-preserved epithelium lay in open spaces surrounded by leucocytes. In numerous alveoli and infundibula the exudate had the appearance of having been aspirated. Denton concluded that the inflammatory process in these very early cases could not be regarded as a complication, but was the extension of a process already well started when the rash appeared. It is also noteworthy that he found an influenza-like Gram-negative organism in the glands and epithelial cells.

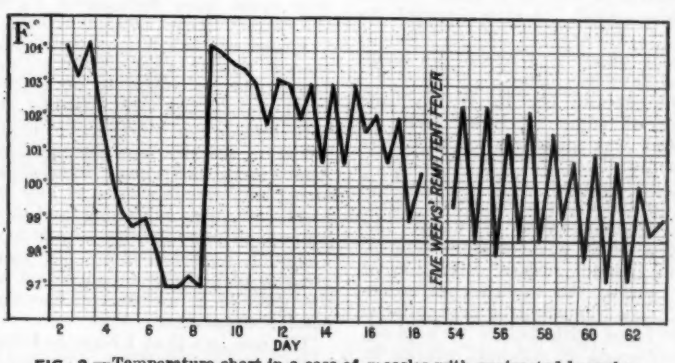

FIG. 2.—Temperature chart in a case of measles with protracted bronchopneumonia ending in complete recovery.

Those who are acquainted with the work of F. G. Blake, R. L. Cecil, and others on the production and spread of lobar pneumonia cannot fail to be struck by the resemblance of the process they describe to the account I have just given of the spread of infection in the lung in measles. The starting-point of inflammation in the lung in lobar pneumonia appears to be the terminal bronchioles, in this instance in the hilum of the lung; thence the pneumococcal invasion radiates along the peri-bronchial and peri-vascular lymphatics and its progress is characterised by œdema, vascular engorgement, and cellular infiltration of the interstitial tissue. These changes precede the consolidation of the alveoli, the infection of the latter being via the adjacent interstitial tissue and not by way of the air-passages. It is only fair to

state that J. F. Gaskell considered that his experimental results did indicate extension along the air-passages.

The respiratory tract is usually accepted as the route of infection in lobar pneumonia, and the success of experimental production of lobar pneumonia by the intratracheal route supports this view, as also does the frequent failure to demonstrate an accompanying pneumococcal septicæmia by means of blood cultures. If we accept the respiratory route for the production of the broncho-pneumonia of measles, certain difficulties arise. We have to assume that a widespread infection has been ten days or more latent in the small bronchioles, and that the broncho-pneumonia is produced in a different way from the generalised rash and fever which suggest a general and not a local infection. The gross appearance of the distribution of the broncho-pneumonic foci in the lungs in early measles calls to mind the distribution of a miliary tuberculosis, which is known to be a blood-stream infection.

On one occasion I have seen acute bronchiolectasis arise as a rapid sequel to influenza in the adult, and it is well known that a less acute bronchiectasis and fibrosis, usually basal in position, may also be the outcome of influenza. It is attributed to a pneumonic process which resembles that seen in measles in that it is interstitial in type, and the inflammatory exudate consists, in most instances, of round cells rather than polymorphs. The acute development of bronchiectasis is usually accepted by those who have experience of the disease in childhood. Autopsies on cases of broncho-pneumonia show that a week is usually too short a time for its establishment, but a fortnight is sufficient.

When we consider the interstitial inflammation extending through the connective tissue framework of the lung, the explanation of the pulmonary fibrosis which may occur as a sequel of measles or whooping-cough seems evident. With this is coupled the weakening or actual destruction of the bronchial walls. A partial obstruction of the small airways with resulting inflation of their territories by a mechanism similar to that which obtains in asthma, coupled with the destruction of some atria and infundibula as well as bronchioles by a suppurative process, is the basis of a saccular bronchiectasis. In some of the cases which have come to autopsy the bronchiectasis is the prominent feature, in others the fibrosis, but in most the conditions are to a great extent coexistent and I believe cœval. I attach very little importance to pleural traction as a cause of bronchiectasis. In early cases pleurisy is absent or insignificant and adhesions have not formed.

In a recent communication, Dr. R. W. B. Ellis gives an explanation of some of these cases of pulmonary fibrosis and bronchiectasis which differs from that which I have just described. From evidence afforded by radiograms coupled with intratracheal injection of lipiodol, he describes a condition which he calls atelectatic bronchiectasis, in which the radiogram shows a triangular paravertebral shadow at the lung base and lipiodol reveals dilatation of the bronchi, usually within the shadow but sometimes more extensive. His hypothesis is that collapse of one or both lower lobes with failure to expand, following broncho-pneumonia in infancy, results in the retention of bronchial secretion and consequent bronchial dilatation. There may be re-expansion of the collapsed lung, especially if the condition of collapse is detected sufficiently early and treated by respiratory exercises and carbon dioxide inhalations, but the longer the condition has lasted the less is the likelihood of recovery.

Without denying that fibrosis and bronchiectasis may sometimes arise in this way, I still believe that in most cases the peculiar nature and mode of spread of the initial inflammation of the lung is the important causal agency in the cases which follow infectious diseases.

In conclusion, it has been my aim in this lecture to draw particular attention to the lung complications to which measles and whooping-cough owe nearly the whole of their mortality, and to adduce further evidence that the danger of these complications is not only immediate but also remote.

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INFECTIONS OF THE HAND*

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My reasons for choosing this apparently elementary title are, firstly, that infective conditions of the hand and fingers are extremely common, and secondly, that I believe that a great deal more thought could, and should, be applied to their care. If I appear to be especially rabid in anything that I may say it is because I regard the loss of one phalanx of one finger or even the loss of function of one phalanx of one finger as a calamity of the first order.

The hand of man is a magnificent thing, anatomically, æsthetically, and functionally. There may be those, whole or maimed, not particularly interested in its anatomical or æsthetic magnificence, but none of us can afford to disregard its functional importance. In hospital practice we see the worst cases of hand infections, and I imagine that for every one we see with a disastrous end-result, there are probably a dozen treated and cured by their local practitioners. But even of those that come to us, there are many who could have been cured earlier and better had the correct line of treatment been adopted.

I need not say much about the pathology of these cases; almost always there is a wound, small or large, and an invasion with the commoner cocci, staphylococci and streptococci. Occasional infections with tetanic and diphtheritic bacilli and spirochætes are seen, and the appropriate therapy is automatic. Apart from mentioning the advisability of administering antitetanic serum in any dirty wound of the hand—notably, gardening and toy pistol injuries—I propose to pass directly to a study of the treatment. I should, however, stress the value of the common practice of putting antiseptic on all wounds, and, in the case of pinpricks, of encouraging bleeding by passive congestion.

The one fact that I hope to bring out in this paper is that every infected hand must be looked upon as an *anatomical* problem. This has not been emphasised sufficiently until recently. Kanavel, of Chicago, was, I believe, the first to bring it home to us in the English language, and his book first published in

* Being a paper read before the West Kent Medico-Chirurgical Society.

1912, and now in its fifth edition, I can strongly recommend.[1] For those who find this monograph too extensive, a shorter book has been published by the late Mr. Fifield, of the London Hospital.[2]

FIG. 1.—Subcuticular whitlow involving deeper tissues.

Infections of the hand (one naturally includes fingers) may be grouped anatomically into five chief varieties: (1) subcuticular whitlow; (2) subcutaneous whitlow; (3) thecal whitlow; (4) subperiosteal or bony whitlow; (5) paronychia. While any of these may coexist, and one variety may pass into another—as I shall indicate from time to time—it is better to look upon them individually at first.

SUBCUTICULAR WHITLOW

Subcuticular whitlow is an infection under the cutis or outer layer of the skin, and may loosely be called an "infected blister." When this condition is seen, the raised cutis should be dissected off (and this is naturally painless) and an antiseptic applied. I prefer spirit or one of the spirity lotions. Even when this is done, there is a tendency for the edge to "grow," requiring further toilet. There may be a gradual invasion of the deeper layers, and sometimes, notably in fishmongers and butchers, the organism is especially virulent, and this may lead to a subcutaneous or thecal whitlow (Fig. 1).

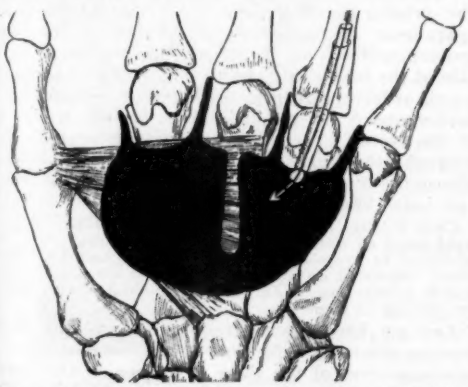

FIG. 2.—Thenar and middle palmar spaces, injected and communicating. (Reproduced from Kanavel's "Infections of the Hand.")

CASE 1.—This man pricked his finger and a subcuticular whitlow followed. By the time he came for treatment the dermis had been eroded in parts and the subcutaneous tissue was involved. The finger rapidly subsided on the treatment indicated.

Sometimes there develops an "hour-glass" abscess, with only a small hole in the thickened skin, connecting a subcuticular with a subcutaneous collection.

SUBCUTANEOUS WHITLOW

Subcutaneous whitlow is the commonest and most important type of infection, and it is here that the exact time and type of treatment adopted will determine whether the end-result is to be fortune or misery.

The condition is well known to all. Following a wound, sometimes minute, the finger, most often

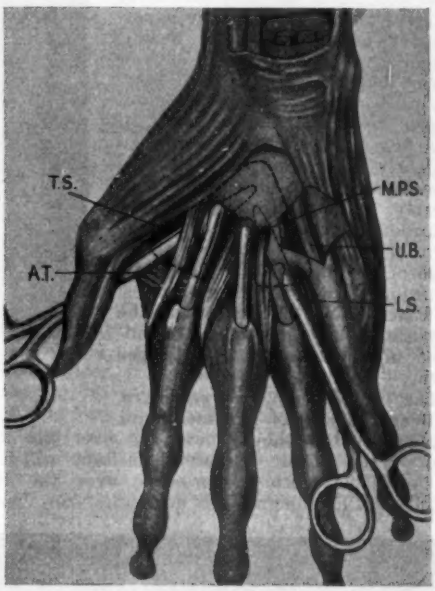

FIG. 3.—Entrance to thenar and middle palmar spaces. A.T.=adductor transversus; L.S.=lumbrical space; M.P.S.=middle palmar space; T.S.=thenar space; U.B.=ulnar bursa. (Reproduced from Kanavel's "Infections of the Hand.")

over the distal phalanx, becomes swollen, red, hot, tender, and useless. Throbbing is present, and the part is strikingly tense. Real fluctuation, always difficult to elicit in a finger, should never be awaited. If the anatomy of the pulp of the finger is studied for a moment it will be found that the subcutaneous tissue is held in position by strong and well-marked fibrous strands forming definite loculi of fatty tissue. The whole of the understanding of the pathology and treatment of the condition depends upon this fact.

Firstly, concerning the pain. Pain and tenderness are always intense where pus is under pressure, and even a small bead of pus, occupying only one or two loculi, will show this sign strikingly. Within limits, larger collections of pus will show more pain. In carbuncle of the back of the neck (where the anatomical arrangement of the fat is similar) exquisite pain and tenderness are also characteristic.

Secondly, concerning the progress. The condition progresses relatively slowly—and this is our greatest danger, for the pus must rupture loculus by loculus as it spreads. The finger does not *appear* to be getting daily much worse, and the pain is disguised by counter-irritation in the form of hot bathing, hot fomentations, poultices, and other fatal local applications. These I would condemn at the outset. Bathing with, or immersion in, hot water only leads to

generalised redness and tenderness of the finger, which makes diagnosis more difficult, and is no lasting comfort to the patient. Fomentations and poultices tend to scald the part at first, and soon get cold and wet, and only serve to increase œdema when applied for more than 24 to 48 hours, and to spread the infection, especially if there is already an open wound.

Thirdly, concerning the treatment. It is absolutely essential that pus under pressure should be relieved at the first possible opportunity, and that every loculus should be opened up. For this reason local anæsthetics—i.e., ethyl chloride—should never be used. Block anæsthesia at the base of the finger may be permissible in an early case, otherwise a general anæsthetic is essential (and not merely a "whiff of gas"). A tourniquet must be used in the form of a strip of rubber round the base of the finger, or a pneumatic tourniquet for more extensive cases. I have elsewhere indicated the importance of a pneumatic tourniquet in operations on the upper limb.[3]

The incision to be employed is over the site of the maximum tenderness, but should never be over the middle line of the finger. A lateral incision, which may be extended into a horseshoe over the tip, is excellent. The operation is deliberate—no "cut and run" surgery—and is an anatomical dissection of the loculi affected. The wound must not be allowed to close too early. Rubber dam is inserted and dry or hypertonic saline dressings are applied. The arm is placed on a splint in a sling.

FIG. 4.—Middle palmar space infection, with incision.

FIG. 5.—Misplaced dorsal incision.

FIG. 6.—Tenosynovitis involving joints.

Let us here consider the dangers of imperfect treatment. The infection, if unrelieved, will surely progress insidiously until the tension is such that the blood-supply to the bone is cut off. Necrosis of the terminal phalanx is thus extremely common, for its artery of supply runs through the pulp of the finger. Alternatively the bone may be involved by direct spread. Next the pus will travel steadily into the proximal parts of the finger, and may, when it reaches the web, pass through to the dorsum. From the base of the finger the pus will tend to pass into the hand itself. It passes usually along the line of the lumbrical muscle into the thenar or middle palmar space. These important spaces are potential spaces between the long flexor tendons in front and the interosseous muscles behind. They are usually distinct from one another, separated by a layer of fascia attached to the third metacarpal. They can be accurately marked out in the hand (Fig. 2), and when either is infected, loss of the normal hollow of the palm is the diagnostic sign. The middle palmar space may be opened up by extending the lateral incision utilised on the finger (preferably along the side of the lumbrical muscle—i.e., radial), and passing a pair of forceps deep to the long flexor tendons; the thenar space by an incision along the radial side of the dorsal aspect of the second metacarpal, going through the first dorsal interosseous muscle, or alternatively through the web between the thumb and index-finger (Fig. 3).

CASE 2 (Fig. 4).—Male, aged 24. Jan. 17th, 1932, cut right hand at work. Subcutaneous infection. Feb. 26th, admitted to hospital, having previously had four operations. Operated on under general anæsthetic, opening up middle palmar space. July 29th, cured. Recovery delayed by stiffness of fingers.

Let me here draw attention to swelling of the dorsum following infections of the volar aspect. In nine cases out of ten there is *no pus* on the dorsum (except in the region of the web, from infections which have reached the base of the finger). The swelling is purely œdematous, and incision is not indicated. Here is a case where dorsal incision led to an opening up of the interphalangeal joint, with destruction of this and the phalanges bounding it.

CASE 3 (Fig. 5).—Male, aged 38. Out of work, one-legged pensioner. Nov. 7th, 1932, ran scissors into thumb. Nov. 22nd, incised on dorsum (misguided). Dec. 7th, admitted to hospital with suppurating wound into interphalangeal joint, and lymphangitis extending up the arm; also boil on right leg from rubbing of artificial limb. Treated

with Bier's passive congestion and hypertonic saline dressings. Dec. 28th, terminal phalanx and part of proximal phalanx removed. Rest of proximal phalanx sequestrated later. Progress delayed by generalised furunculosis.

I have indicated how the middle palmar and thenar spaces may become involved, and how the bone is easily destroyed through a cutting off of its blood-supply. A complication worse than either of these is a spread of infection to the tendon sheath.

THECAL WHITLOW (SUPPURATIVE TENOSYNOVITIS)

Let me first draw your attention to the anatomy of the flexor tendon sheaths of the hand. The sheath of the flexor longus pollicis runs from the base of the terminal phalanx of the thumb to a point an inch above the transverse carpal ligament. The sheaths for the index, middle, and ring fingers run from the base of the terminal phalanx to a point in front of the metacarpo-phalangeal joints. The sheath for the little finger communicates in the palm with the large common sheath of flexor digitorum sublimis and profundus, which in turn extends above the transverse carpal ligament. This is sometimes called the ulnar bursa.

From these facts we learn many lessons. As in each finger the sheath extends distally only as far as the base of the terminal phalanx, it is not usually endangered in everyday pinpricks, which mostly fall on the bulbous part of the finger. But it may be infected in this way, by direct injury.

CASE 4.—A colleague of mine, operating upon a case of pneumococcal peritonitis, pricked his right index-finger, and in a few hours had pneumococcal tenosynovitis, and very nearly died from the septicæmia resulting. He was lucky to escape with his life and his finger, though this is now stiff.

FIG. 7.—End-result of tenosynovitis, with fusion of carpal bones.

We learn also that infection of the sheath of the thumb or little finger is infinitely more dangerous than infection of the other fingers, for in the former, infection rapidly passes up above the carpal ligament. It may, furthermore, pass from either of these sheaths to the other.

CASE 5.—Female, aged 63, charwoman, diabetic. Jan. 22nd, 1933, splinter in thumb. 24th, knocked hand at work. 25th, thumb swollen, with signs of involvement of ulnar bursa. Hand incised 25th, 26th, and 27th. Definite infection of ulnar bursa, though thumb apparently uninvolved. Feb. 1st, death from septicæmia.

I have a similar case under my care at the moment.

The sheaths may therefore be involved by direct injury or by direct spread from one to another, and sometimes they appear to be involved through the blood stream. They are often involved by direct spread from a subcutaneous whitlow, especially if misdirected incisions injure the fibrous coat of the sheath.

Sheath infections are easily diagnosed by the following characteristics. There is :—

(*a*) Uniform swelling of the whole finger.
(*b*) Exquisite tenderness over the line of the tendon particularly at its proximal end.

FIG. 8.—New bone formation.

(*c*) A maintenance of a position of flexion.
(*d*) Pain on passive movement, especially extension.

Treatment is by lateral incision in the line of the tendon opening the sheath freely, leaving possibly support opposite the joints to prevent excessive prolapse of the tendon. In the case of the thumb and little finger, it is preferable to spare the transverse carpal ligament, and to incise again above this, though in a bad case this too should be cut through, and ligatures applied to the superficial palmar arch and large branches of the radial and ulnar arteries.

CASE 6 (Fig. 6).—Male, aged 36, labourer. Feb. 4th, 1932, small blister on terminal phalanx, right middle finger. 10th, tender along tendon. Finger incised in casualty department. 12th, reincised, saline baths. 15th, admitted to hospital. Two incisions made on flexor aspect to open tendon sheath fully. 19th, further incisions. March 15th, as X rays revealed necrosis of bones, and both interphalangeal joints were involved, amputation was carried out. Quick recovery.

Complications of incomplete treatment are :—

1. Rupture into the thenar or middle palmar space.
2. Rupture into the forearm, between the flexor tendons and the pronator quadratus.
3. Involvement of bones—phalanges, metacarpals, and carpals.

The following case illustrates these complications.

CASE 7.—Female, aged 45. August 24th, 1926, pricked her thumb cleaning fish, where a subcuticular whitlow appeared. 26th, the whole hand was swollen and tenosynovitis of the little finger sheath was manifest. Admitted. Sheath incised. A day later thin pus was present above the wrist and the space behind the flexor tendons was drained. Bacteriological examination revealed *Staphylococcus aureus* and *Streptococcus longus*, and antistreptococcal serum was administered daily. Sept. 7th, secondary hæmorrhage required ligature of the radial and ulnar arteries in the forearm. 17th, the carpal joints were now involved, and the first row of the carpus was excised. 24th, antistreptococcal vaccine exhibited. Nov. 15th, discharged. Jan. 31st, 1933, to-day she has a rigid wrist and carpus, with fusion of the bones, and stiffness of the carpo-metacarpal and metacarpo-phalangeal joints, in a position of flexion (Fig. 7).

This case, therefore, illustrates the worst that can happen in the way of complications following a suppurative tenosynovitis, itself the sequel of a prick with a fishbone.

SUBPERIOSTEAL OR BONY WHITLOW

This is usually an extension from one of the foregoing varieties, though it may occur as a result of direct injury, as in a compound fracture. The bone necroses freely, and has then to be removed. The diaphysis of the terminal phalanx is most frequently

lost in this manner, though other bones may be affected. When an interphalangeal joint is involved in a working man, amputation is indicated, for by conservative treatment the best that can be hoped for is a stiff finger, after often many months of suppuration. Yet it is remarkable how much bone may be re-formed.

CASE 2, above (Fig. 8).—In this man the two phalanges of the thumb were almost completely sequestrated, but since it was the thumb that was involved, and as time was not an important factor, amputation was not carried out. The bone has been re-formed to an amazing extent.

FIG. 9.—Operation for paronychia. (Reproduced from Kanavel's "Infections of the Hand.")

PARONYCHIA

By this is meant an infection around the nail, usually the sequel to an inflamed skin-tag. A horseshoe-shaped red swelling occurs proximal to the visible part of the nail, and pus may discharge about the base of the nail. Fluctuation as a sign is here especially deceptive, for it cannot be applied satisfactorily in a longitudinal direction, and a sense of transverse fluctuation can be obtained, as in most parts of the finger, in the normal individual.

Kanavel is responsible for the greatest advance in the treatment of this condition. It used to be the custom to pull the nail off, and to do little else. I must unhesitatingly condemn this as the wrong line of treatment. Granulations spring up about the nail bed, and a pocket is left with an overhanging flap of skin, which does not allow of free drainage, and usually takes six weeks or more to heal. Furthermore, the unaffected distal part of the nail is torn off leaving a very tender finger.

The anatomical situation of the pus is between the proximal part of the nail and the nail bed. The correct treatment is thus to expose this by one or sometimes two lateral incisions, in the line of the edge of the nail, turning back the skin flap thus created, and to remove the *proximal* part of the nail only (Fig. 9). The lateral incisions are to be made carefully to avoid damaging the nail bed, or a permanently split nail may result. A strip of vaseline gauze, which allows for free exit of discharges, is placed under the skin flap to prevent too early healing, though this may be discarded in a few days, and the finger is usually well in 10–14 days.

OTHER TYPES OF INFECTION

There are a few other types of infection that require special notice.

Lymphangitis is an important condition which must be distinguished from those already mentioned. There is redness and swelling of a finger, with no marked tension, no point of exquisite tenderness, and no intense pain on movement. There may be red lines extending up the arm, marking out the lymphatic vessels, and there usually is pain in the regional lymph glands, even before these are swollen. There is a very intimate plexus of superficial and deep lymphatics in the hand, and since drainage by this route is thus remarkably free, it is not surprising that in these cases constitutional disturbance is very profound.

Rest in bed is especially essential, with the arm on a splint, with heat, preferably dry, applied. Bier's congestion is useful in limiting the absorption of toxins. I have indicated that there is no especial point of tenderness, and incision is therefore not only not indicated but is definitely dangerous, for it tends to open up new tissue planes and increase the absorption. The infecting organism is usually a streptococcus, and antistreptococcal sera are often of great value. In other words, the treatment is essentially general.

Carbuncles and boils may occur on the hand and fingers. In these we have a staphylococcal infection, often starting in a nail follicle, spreading subcutaneously through dense subcutaneous tissues, leading therefore to great tension, indicated by great pain and tenderness. Free drainage is essential, and is obtained by cruciate incisions through the centre of the infection, with undercutting of the four flaps thus created. Hypertonic solutions of magnesium sulphate or saline are very useful as a dressing. Here I might mention the pernicious practice

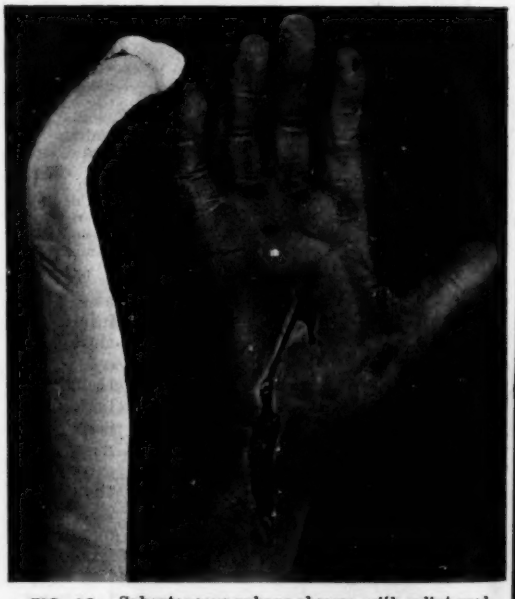

FIG. 10.—Subcutaneous palmar abscess, with splint used.

of squeezing such lesions, or for the matter of that, any infected lesions. It can only do harm by further macerating the tissues. If the exit for the pus is not free it is an indication for proper incision.

Dorsal infections require passing notice. As indicated they hardly ever occur through spread from the volar aspect (except in the region of the web), and while much less common, are usually due to direct injuries. As the hand and fingers are free of dorsal tendon sheaths these infections are usually

uncomplicated, and, except when they open up joints, respond well to treatment by simple incision.

SUMMARY

I have indicated the importance and gravity of infections of the hand and fingers, especially those of the flexor aspect, and especially those occurring in certain trades—e.g., fishmongers and butchers. I have indicated how these infections must be classified anatomically. I have indicated the correct surgical treatment in each case. Rest, with splint and sling, and preferably in bed, is essential at first. A plaster splint in the "position of function" (wrist dorsiflexed and fingers partly flexed) is excellent (Fig. 10).

Once the infection is in check splints and dressings are to be removed for increasing periods daily, with the hand in a hot saline or hot air bath, and active movements are to be encouraged lest, following an infection of one finger, the whole hand is beset with an intractable stiffness.

Hot moist dressings are to be avoided. Spirity solutions, hypertonic salines, or solutions of mag. sulph. may be applied, provided always the incision is sufficient. Bier's hyperæmia is an excellent adjuvant, especially in lymphangitis, and is applied by placing a soft rubber band either around the finger or around the arm, not too tightly, for as long as the patient can tolerate it.

I have not attempted to be exhaustive in this paper, but I have dealt with the commoner conditions as we see them in hospitals.

I have to thank Mr. C. H. Fagge and Mr. E. G. Slesinger, of Guy's Hospital, for permission to record Cases 4 and 7, and the author and publishers of Kanavel's book (Messrs. Lea and Febiger, Philadelphia) for some of the illustrations.

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THE ÆTIOLOGY OF NOCTURNAL ENURESIS

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THE frequency of nocturnal enuresis in children, the distress it causes to the child and the amount of worry to the parent, and, not least, the difficulty of obtaining satisfactory therapeutic results, make it a subject of considerable importance.

What follows is an account of an investigation carried out at the Maudsley Hospital child guidance department. A hundred cases of enuresis were examined and also 50 unselected cases attending the department for other reasons. The 150 children were divided into three groups. Group I. consisted of 50 cases of enuresis referred for treatment by care committees and district medical officers from elementary schools; Group II. of 50 cases of enuresis referred from L.C.C. residential schools; Group III. served as a control group of 50 children, and was made up of children showing anxiety states (44 per cent.), mild delinquency and truancy (34 per cent.), and disorders such as backwardness due to a minor degree of mental defect or chorea (22 per cent.) from the same sources as Group I.

I do not propose to discuss here any of the cases in detail, or to indicate in any particular case the meaning this symptom may have for the child. But I have selected certain points in the histories, and considered their frequency.

The findings may be conveniently summarised as follows:—

HEREDITY

In many cases of enuresis inquiry revealed that either a parent or uncle or aunt had also suffered from very troublesome enuresis as a child. In Group I. 40 per cent. of the children had such a history, but in the control group, Group III., only 14 per cent. Unfortunately it was not possible to obtain information on this point about the children in Group II., from residential schools, as in most cases the parents were either unknown or untraceable.

It is often stated that families showing epilepsy in their family histories usually show a higher incidence of enuresis in other members of the family than do normal families. It does not, of course, necessarily follow from this that cases of enuresis are more likely to show an epileptic heredity than the normal, but such a connexion is suggested. In this series no such correlation was found. In the enuretic group 8 per cent. had a history of epilepsy in other members of the family; in Group III. 6 per cent.—figures roughly comparable. The numbers are too small to draw any conclusion, but nevertheless the finding appears worth mentioning.

In Group I. 12 per cent. of the children had one or more siblings who were also enuretic; of this 12 per cent. four children showed a hereditary factor, two did not. Two identical twins who attended the hospital too late to be included in the series showed enuresis with very similar symptomatology, and had a family history of enuresis.

TYPE OF PARENT

In Group I. and Group III. the number of marked anxiety states, or very marked abnormality of relationship to the child, in the parents, was much the same. Moderation, where this could be obtained, in an over-anxious or over-censorious attitude appeared to benefit the enuretic perhaps more than the child showing a marked anxiety state. In residential schools where the children have a common environment, the incidence of nocturnal enuresis appeared to be between 8 and 10 per cent.

TYPE OF CHILD

1. *Intelligence.*—From both the enuretic and the control groups (I. and III.) children with an intelligence quotient under 80 were excluded, as it was held that any gross degree of mental defect would unduly complicate the problem. Careful psychometric investigation showed that both groups had an equal number of children above and below 100, and also that the numbers at different levels were roughly comparable. In Group II. there were fewer children with an I.Q. over 100. This may possibly be attributed to a general lower level of intelligence in residential schools, but definite information on this point was not available.

These results suggest that the intelligence of children sent to a clinic for enuresis is very similar to that of children referred for other reasons.

2. *Other symptoms.*—It is generally stated that enuretic children are of a nervous, highly strung type. While in the majority of children of this series showing the symptom of enuresis additional trouble was evident, even if this seemed to consist only of extreme worry and conflict resulting from the situation caused by the enuresis, it was only in 24 per cent. that a very marked anxiety state or behaviour disorder was shown which, in itself, would have made

it extremely probable that the child would have been referred for treatment, apart from the accompanying enuresis.

While children of Group I. tended to have anxiety signs and symptoms associated with their enuresis, those of Group II. appeared to tend rather toward sulkiness and an attitude of defiance.

TYPE OF ENURESIS

1. *The age of onset* was found to be very variable, but cases could be divided approximately into three groups: 58 per cent. were said to have wet the bed since birth; 32 per cent. had been trained in cleanliness, but from 3½ to 5 years had commenced nocturnal enuresis; while 10 per cent. only showed it in later childhood. Of the last group, none showed a hereditary factor, and all recovered with treatment.

2. *Other forms of incontinence in association.*—Diurnal frequency of micturition was a very common symptom; 12 per cent. showed, in addition, diurnal incontinence which was in 6 per cent. combined with occasional fæcal incontinence. In two children, not included in the series, diurnal incontinence occurred without any nocturnal enuresis, and one of them came of a family showing several cases of nocturnal enuresis.

In several instances in older boys it appeared as though seminal emissions took the place of nocturnal enuresis in the emotional life as the latter symptom cleared up.

3. *Frequency and time of occurrence of enuresis.*—The great majority, 74 per cent., showed regular, frequent enuresis with only occasional, and very short, dry periods, if these occurred at all. In cases in which enuresis had taken place nightly for many years, it appears possible that it was due to a simple reflex emptying of the organ when it had filled to a certain point. A series of experiments was performed to throw further light upon this, if possible. The mother of a case was asked to raise the child to pass water at different times in the night, and to measure the amount passed. She was also instructed to note, as accurately as possible, the time at which the enuresis occurred. The amount of fluid allowed in the last six hours of the day was varied within as wide limits as possible. By this means an attempt was made to see if any relation could be demonstrated between the amount of urine in the bladder and the time and amount of enuresis. No such relationship could be shown. In the same way the depth of sleep was varied by the administration of sedatives such as bromide and luminal as, possibly, the threshold quantity of urine in the bladder for emptying might be directly related to this. This experiment, again, produced no positive result. The experiments are very far from conclusive, but they appear worth mentioning nevertheless.

RESULTS OF TREATMENT

It was found that approximately 40 per cent. of the children of Group I. showed a rapid and striking improvement or complete recovery, which was maintained over a period of observation of some months. In Group III., those from residential schools, a much lower recovery rate was obtained. This may be related to the fact that all these are cases in which careful attention and routine have already failed, and also that, where the needs of an individual child are not satisfied, environmental readjustment is much more difficult. Results here, therefore, depend almost entirely on the individual treatment of the case.

As might be expected no special drug appeared to be of particular value; belladonna, for instance, did not seem to possess advantage over any other drug prescribed with equal apparent confidence. Similarly, while limiting fluids and instituting a strict régime was often successful, an equally dramatic cessation of such a system produced as good results. Amongst adjustment of single factors in the environment, relief from a particular strain, such as the undue "pushing" of a clever child at school or the setting of a too high standard for the mentally retarded, was sometimes successful. In all cases an alteration, so far as possible, of the attitude of the parent and child to the trouble was attempted, and an endeavour made to increase the child's understanding of the emotional trends related to this particular behaviour abnormality.

Apart from those children with a late onset (10 per cent. of Group I.), none of whom had a family history and all of whom recovered, no definite correlation between improvement with treatment and absence of a hereditary factor could be made.

DISCUSSION

The present study suggests that hereditary factors may play a larger part in the ætiology of nocturnal enuresis than is usually admitted. The figures (40 per cent. of Group I. and 14 per cent. of Group II.) showing enuretic heredity are open to many statistical objections, but there is so much difference between the two that it appears safe to assume that enuretics are definitely more likely than other children to have a family history of the trouble.

The interpretation of this presents many difficulties. It may be that a certain structural defect is inherited, and that environmental influence plays little part. In some families this appears a probable explanation. For instance, a girl was brought to the hospital suffering from nocturnal enuresis. Inquiry revealed that: (1) she had a sister who was unaffected; (2) her mother had been an enuretic in childhood; (3) of six maternal aunts, one had been an enuretic; (4) of five maternal uncles, three had been affected; (5) of her three cousins, all of unaffected mothers (maternal aunts to the patient), one is a nocturnal enuretic with an unaffected sister, while the third cousin is a diurnal enuretic. There is no history of severe neurosis, epilepsy, organic disease of the nervous system, or spina bifida in the family. It has not yet been possible to investigate family histories of other cases in sufficient detail to find whether such a high incidence is at all common and whether any specific manner of inheritance can be demonstrated.

Perhaps this apparent tendency for enuresis to run in families is really due to an extreme prevalence of the condition in childhood in the general population. This explanation appears very unlikely—a view supported by the low incidence in residential schools (8 to 10 per cent.).

It is possible that a psychological attitude which resulted in a reaction of bed-wetting in the parent will be reproduced in the child by the direct influence of the parent. This may be true in a large number of cases, but it cannot explain satisfactorily those in which not the parent, but an uncle or an aunt, are affected, unless one introduces a similar psychological attitude in the grandparents and, even allowing this, one has then to account for the prevalence of such an attitude in a family, and consider, in consequence, an inherited tendency not to wet the bed, but to make others do so!

In conclusion it may be said that this investigation suggests that in a given case of nocturnal enuresis it will be of value to consider the possibility of a strong hereditary tendency. If it is present, a

knowledge of this should aid in correctly evaluating the importance of present environmental factors and of understanding the parents' attitude towards the patient, in that it may be dependent upon a more or less conscious memory of a similar situation in their own past. It only remains to note how infrequently in this series was it possible to establish any organic "cause" so often held responsible for the condition, such as phimosis, intestinal worms, cystitis, and so forth.

SUMMARY

Observations on 100 cases of nocturnal enuresis and 50 control cases are reported. The most interesting finding is the frequency with which enuresis appeared in the parents or their siblings, showing a frequency of 40 per cent. in 50 cases, as compared with 14 per cent. in the control group. In the other 50 cases of enuresis particulars of family histories could not be obtained.

In conclusion I wish to thank Dr. Edward Mapother for kindly allowing me to use case material at the Maudsley Hospital.

THE NATURE OF THE HÆMOPOIETIC FACTOR IN MARMITE*

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IN previous papers [1] I have described tropical macrocytic anæmia, including the so-called pernicious anæmia of pregnancy, and have demonstrated the curative action of marmite. The work led to the trial of this preparation in other macrocytic anæmias. Vaughan and Hunter [2] showed that it was active curatively in macrocytic anæmia associated with congenital steatorrhœa, Strauss and Castle [3] report cures with it in certain cases of sprue anæmia, and Goodall [4] and Ungley [5] in a series of cases of true Addison's anæmia. Davidson [6] first reported several cases of Addison's anæmia in which marmite had failed to induce a remission, but in a more recent communication [7] he reports the successful treatment of certain cases with this preparation. Strauss and Castle [8] considered the possibility that marmite might contain the extrinsic factor, which according to these workers interacts with an intrinsic factor present in normal human gastric juice to form the hæmopoietic principle present in liver. To test this theory they incubated marmite (an autolysed yeast extract sold as Vegex in America) with normal gastric juice and showed that in doses equivalent to 12 g. of marmite this mixture produced typical reticulocyte crises, and remissions in true Addison's anæmia. They further showed that autoclaving did not destroy the factor, neither was it precipitated or inactivated by 80 per cent. alcohol. They postulated vitamin B_2 or some factor associated with it as the extrinsic factor and presumably the curative factor in the tropical condition, in which the intrinsic factor is assumed to be present.

In previous work [1 9] I have put forward the suggestion that vitamin B_2 or some protein derivative of yeast is the active factor in marmite, and this was the position when the present work was begun. A scrutiny of Strauss and Castle's work suggested to me, however, that vitamin B_2 might not be the active hæmopoietic factor. These authors showed that the filtrate obtained after precipitating the bulk of the protein in marmite with 80 per cent. alcohol still contained their extrinsic factor. Chick and Copping,[10] however, have demonstrated that alcohol of such strength inactivates or destroys vitamin B_2 in concentrated watery yeast extracts. There was some doubt, therefore, whether vitamin B_2 was related to the hæmopoietic factor, but it was taken for granted that the factor, whatever its nature, would be present as such in untreated yeast as well as in marmite. This assumption led to various blank experiments.

The Trials Planned

One of the experiments planned was a clinical trial to test the hæmopoietic effect of the various vitamin B fractions in cases of tropical macrocytic anæmia. This trial was carried out in Bombay. The cases used were as far as possible uncomplicated, and included both men and women, certain of the latter being pregnant. The diagnosis was made on a full blood examination, including a Price-Jones curve. Alcohol test-meals demonstrated the presence of free hydrochloric acid in all patients except one on whom only one test was done. The patients were mostly on the ordinary hospital diets, those with the most severe anæmia being on milk only. Experience in other years had demonstrated in a tragic manner that these diets have no curative action, and further that in the majority of cases a control period is impossible, partly because of the severity of the anæmia, and partly because the patients tend to discharge themselves if kept in hospital more than a few weeks at most. However, most of the patients in this series had been in hospital for a few days before treatment was begun, and some had been in for some time on general treatment with no improvement.

The activity of a preparation under trial was judged by the magnitude of the reticulocyte crisis and the subsequent rate of blood regeneration. A preparation was only considered active if it had been tried on patients who had either previously failed to respond to some other fraction, or else had been under observation and were known not to be healing. Conversely, a preparation was considered inactive only if the particular patients treated with it without showing improvement later responded to a preparation of known potency.

PREPARATIONS TESTED

It is a pleasure to acknowledge the help given by Miss Harriette Chick, D.Sc., and her co-workers at the Lister Institute, London, both in the preparation and standardisation of many of the extracts used. Dr. Chick had previously compared the vitamin B potency of the unflavoured marmite used in my original work in Bombay and found that it was comparable with that of dried yeast. The minimum human dose was 40 times the rat's daily ration. It was assumed that the marmite used in the present work would have approximately the same vitamin B potency, as it was the same unflavoured preparation. All the preparations that contained vitamin B_2 were standardised in terms of this vitamin, and given in doses that corresponded with the dose of marmite previously used. Later the dose of both marmite and the other extracts used were increased to ensure a maximal response in all cases.

Yeast powder.—This dried yeast was given by the Amritsar Distillery Co. for clinical trial. The daily dose was 30 g. given in divided doses with milk and sugar. The patients took it quite readily, and in these doses it did not produce diarrhœa. When the yeast was tested biologically on rats (method of Chick and Roscoe [11]) for its content of vitamin B_2, it was found to be markedly less than that

* The expenses of this work were met by a grant from the Indian Research Fund Association.

of an average sample of dried English brewer's yeast. This suggests that it might also have a lower content of other important biological factors.

Watery yeast extracts.—These extracts were prepared at the Lister Institute from washed brewer's yeast, according to the method of Roscoe.[12] The watery extract is filtered off from the insoluble residue so that the final extract contains very much less protein than the original yeast. The daily dose was equivalent to 15, 30, or more grammes of dried yeast—i.e., the human dose was 75, 150, or more times the rat dose. The extract was used as originally prepared, and also after autoclaving for five hours at 120° C. and 20 lb. pressure.

Marmite.—Unflavoured marmite was placed at my disposal through the courtesy of the Marmite Food Extract Co. The use of this excluded the vegetables, added to the commercial extract for flavouring as a possible source of the hæmopoietic factor. This extract was originally used in doses of 15 g. daily, but this dose was later increased to 30 g. to ensure a maximal response in all cases.

Insoluble and soluble fractions of marmite.—A known weight of marmite was mixed with an approximately equal weight of water, brought to the boil and boiled for two minutes. On filtering this mixture an insoluble residue was left. This was given in daily doses equivalent to 35 g. of the original marmite to allow for any possible loss on the filter paper. The filtrate was given in doses equivalent to 30 g. of marmite.

Autoclaved marmite.—A known weight of marmite was dissolved in water as described above, and then autoclaved for five hours at 120° C. and 20 lb. pressure. The original pH of this solution was 5·5. It was assumed that all the vitamin B_1 was destroyed by this treatment. The final solution was given in doses equivalent to 30 g. of marmite.

Alkaline autoclaved marmite.—A watery solution was made as before, but was made alkaline to pH 9 before autoclaving. In an attempt to destroy the vitamin B_2 present, the mixture was heated for ten hours. The stability of vitamin B_2 has been found to vary according to the medium in which it is present, and it is possible that although prolonged heating in an alkaline medium destroys this vitamin in yeast or aqueous yeast extracts[10] it may not be so destructive towards this vitamin in marmite (Guha[13]). Roscoe (unpublished work), however, has found vitamin B_2 in marmite to be only slightly more stable than in a watery yeast extract. It is therefore unlikely that more than traces remained in this preparation. Heating for ten hours brought down a heavy sticky precipitate that was very difficult to administer with the fluid fraction. For this reason the preparation was given in daily doses equivalent to 45 g. of the original marmite to ensure an adequate intake.

Alcoholic extract of marmite.—A weighed quantity of marmite was taken up with sufficient water to allow it to pour easily, and then added to sufficient absolute alcohol to make the final concentration 80 per cent. This was done with varying quantities of water and alcohol, as the physical nature of the precipitate varied with the concentration of the marmite, but analyses showed that as long as the final concentration was 80 per cent. the actual amount of protein precipitated was the same. The filtrate was originally given in daily doses equivalent to 30 g. of marmite, but later larger doses were used.

Acid clay vitamin B_1 and B_4.—Prof. B. C. P. Jansen, of Amsterdam, kindly gave me a supply of this preparation. It consists of vitamins B_1 and B_4 (Reader[14]) from rice polishings adsorbed on to acid clay. The curative dose in beri-beri is 2–4 g. daily; the larger dose was used in the present work.

Vitamin B_2 from egg white.—This extract was prepared at the Lister Institute according to the method of Chick and co-workers.[15] Forty c.cm. were equivalent to 15 g. dried yeast in vitamin B_2 potency, and so more than equivalent to the original marmite dose. It was actually given in daily doses of 45 and 90 c.cm.

Clinical Trials

Vitamins B_1 and B_4.—Before making a trial of the hæmopoietic action of vitamin B_2 it was decided to exclude vitamin B_1, and with B_1 vitamin B_4 as the curative factor. Two patients were therefore given the acid clay for a period of ten days. Neither case responded, one went down hill and the other remained stationary. Both cases later responded typically to marmite preparations. A negative control to this experiment is afforded by the fact that cases treated with autoclaved marmite, in which the vitamin B_1 has been destroyed, responded immediately with a maximal reticulocyte crisis followed by a typical remission. As vitamin B_4 is present in the acid clay, this vitamin, as well as B_1, is excluded as the active factor in the cure of these anæmias.

Vitamin B_2, which had been postulated as the active curative factor, then came under consideration. As previous trials had all been made on marmite, a yeast product, it seemed highly desirable to try another source of this vitamin, and for this purpose the egg white extract was used. As will be seen from the Table, this preparation was completely inactive, even in doses equivalent, in terms of vitamin B_2, to more than seven times the original curative dose of marmite, and twice the maximum dose used in the present work. Additional evidence that this vitamin is not the hæmopoietic factor in marmite is, however, provided by the facts: (1) that watery yeast extracts of known vitamin B_2 potency were inactive and also yeast itself; and (2) that marmite after subjection to severe heating in alkaline solution, and containing therefore at most only traces of this vitamin, retained some curative power (see below).

Watery yeast extracts.—Before it became almost certain that vitamin B_2 was not the active principle in marmite, an extended trial of watery yeast extracts, known good sources of vitamin B_2, had been made. Ten cases treated with these extracts, in doses equivalent in their vitamin B_2 content to the curative marmite dose, all failed to respond.

Dried yeast powder.—The watery yeast extracts used above, though good sources of the vitamin B complex, only contain the water-soluble fractions of yeast, and are poor sources of yeast proteins. A dried yeast powder was therefore given to five patients; this powder, in doses up to 30 and more grammes daily, was inactive curatively, all the patients responding to preparations of marmite later.

Marmite.—This extract was again found to be active in doses of 15 g. daily, but to allow a larger margin of safety in the trial of different fractions and also to be certain of a maximal reticulocyte crisis in all cases this dose was increased to 30 g. After the vitamin B complex had been excluded, and also an untreated yeast as the curative factor, attention naturally turned to the nature of marmite as distinct from other yeast preparations. The trial of insoluble and soluble fractions showed that the active principle is water-soluble. It is also alcohol-soluble, as the filtrate after precipitation with 80 per cent. alcohol is still active curatively, though the fact that some cases did not make a maximal response on daily doses equivalent to 30 g. of untreated marmite suggests that some of this factor is lost in this process, possibly through inadequate washing of the precipitate. The activity of this alcohol filtrate is further evidence that vitamin B_2 is not the curative factor as treatment with 80 per cent. alcohol destroys or inactivates this vitamin.

The hæmopoietic principle in marmite is heat stable; after autoclaving for five hours at pH 5·5 at 120° C. and 20 lb. pressure the preparation is as active as before. In fact, the cures on the autoclaved marmite were so spectacular that the tendency was to give this preparation rather than untreated marmite to the very severe cases, but till the minimal curative dose of marmite is known, the question of an increase of potency by heating must remain unanswered. Autoclaving at pH 9·0 for ten hours caused considerable decrease in the curative action of marmite perhaps associated with the large insoluble residue which forms and is very difficult to administer.

Discussion

The clinical trials reported above were designed to investigate the nature of the hæmopoietic principle

TABLE SHOWING RESPONSE TO VARIOUS PREPARATIONS OF YEAST AND THE VITAMIN B COMPLEX

Days of treatment.	Case number and sex.																					
—	104 M.		58 F.		68 F.		69 F.		3 F.		105 M.		93 F.		104 M.		52 M.		107 M.		106 M.	
FIRST PERIOD.—*Daily Dose of Substance Administered*																						
	Acid clay.		Egg white.		Dried yeast. (Indian).		Autocl. watery yeast extract.		Marmite.		Insol. fraction of marmite.		80 per cent. alcohol filtrate.				Autocl. marmite.		Autocl. alkaline marmite.			
	4 g.		Equiv. to 60 g. Lister yeast.		30 g.		Equiv. to 36 g. Lister yeast.		15 g.		Equiv. to 35 g. marmite.		Equiv. to 30 g. marmite.		Equiv. to 30 g. marmite.		30 g.		Equiv. to 45 g. marmite.		Equiv. to 30 g. marmite.	
0	RBC* 3·110	Ret.* 0·8	RBC 1·970	Ret. 1·8	RBC 1·230	Ret. 2·8	RBC 0·931	Ret. 0·8	RBC 0·976	Ret. 1·0	RBC 2·023	Ret. 0·9	RBC 1·450	Ret. 1·1	RBC 2·333	Ret. 0·9	RBC 1·170	Ret. 2·1	RBC 1·930	Ret. 0·1	RBC 1·255	Ret. 0·5
2	..	..	..	0·5	..	1·8	..	2·3	..	0·9	..	..	..	2·0	..	0·6	..	1·5	..	2·6	..	0·3
4	..	0·9	..	0·75	1·226	2·6	..	1·5	..	7·0	..	1·5	..	4·3	2·280	0·8	1·070	6·4	..	4·0	..	1·3
6	..	0·7	1·707	1·5	..	1·0	0·883	2·7	1·210	**26·0**	..	2·7	..	2·5	..	1·0	..	16·0	2·040	**9·5**	..	3·0
8	..	0·6	..	0·9	1·180	1·6	..	2·0	..	9·0	2·020	0·9	..	9·7	..	**4·5**	1·490	**35·3**	..	2·6	1·320	4·0
10	2·333	0·8	1·980	0·7	..	3·4	0·992	2·4	1·500	..	..	0·5	1·797	**20·0**	2·460	3·8	..	8·0	2·315	4·9	..	5·1
SECOND PERIOD.—*Dose of Substance Administered*																						
	Marmite.		Autocl. marmite.		Marmite.		Autocl. marmite.		—		Soluble fraction.		—		Marmite.		—		—		Autocl. alkaline marmite.	
	30 g.		30 g.		30 g.		30 g.		—		Equiv. to 30 g. marmite.		—		30 g.		—		—		Equiv. to 45 g. marmite.	
0	RBC 2·590	Ret. 0·8†	RBC 1·810	Ret. 0·7	RBC 1·180	Ret. 1·3	RBC 0·990	Ret. 2·4	..	..	RBC 2·030	Ret. 0·5	..	..	RBC 2·590	Ret. 0·8	..	..	..	..	..	5·2
2	..	0·7	..	1·0	..	3·5	..	2·4	..	..	..	0·7	..	..	..	0·7	..	..	..	..	..	4·6
4	2·868	9·1	..	2·5	..	4·0	..	4·0	..	..	..	4·1	..	..	2·868	9·1	..	..	..	..	..	6·0
6	..	11·0	1·560	12·6	..	13·0	1·015	12·0	..	..	2·780	11·0	..	..	..	11·0	..	..	..	..	..	6·6
8	..	14·0	..	**16·0**	1·250	**32·0**	..	**28·0**	..	..	..	**12·0**	..	..	..	14·0	..	..	..	..	1·487	**9·4‡**
10	3·610	**17·0**	2·290	3·0	..	10·0	..	15·6	..	..	3·250	3·0	..	..	3·610	17·0	..	..	..	..	..	..

* RBC = red blood-cells in millions per c.mm. Ret. = percentage of reticulocytes in total red cells.
† Treated with alcoholic filtrate for ten days between first and second period.
‡ Gave maximal response to marmite later. Autocl. = autoclaved.

present in marmite, a yeast extract which had been shown by the author and other workers to be curative in tropical and other macrocytic anæmias. In view of the results reviewed in the introduction to this paper, the present work was planned particularly to investigate the hæmopoietic action, if any, of vitamin B_2 from yeast and other sources.

The complete inactivity of watery yeast extracts of known potency as regards the vitamin B complex, and also of preparations of these B vitamins from sources other than yeast, excludes them as the factor curative in tropical macrocytic anæmia and, presumably, as Castle's extrinsic factor. Large doses of a dried yeast were also inactive therapeutically. Unfortunately, this particular yeast was a poor source of vitamin B_2, and might therefore have been lacking in other important factors.† However, the doses used were large, and yet there was no hæmopoietic response. There remains then the question of the nature of the curative factor present in marmite.

Marmite is an autolysed yeast extract made from brewer's yeast. Salt is added during the process of manufacture, and this is the only addition made to the unflavoured extract used in this work. Its hæmopoietic factor, whatever its nature may be, is water- and alcohol-soluble, and heat-stable. Though water-soluble, it was not present in watery extracts of washed brewers yeast, or in the particular sample of dried yeast used. These properties tell us little as to the nature of this active factor, but it is worth while, with a view to future work, to consider the possibility of it being a protein breakdown product. Marmite is made from yeast by a process of autolysis; this will destroy most of the glycogen present, and break down some of the protein into its simpler products. Marmite may therefore owe its hæmopoietic properties to one of these breakdown products.

† Since writing the above a trial has been made of a sample of dried brewers' yeast known to be a rich source of vitamin B_2. Two cases of macrocytic anæmia gave no response to 30 g. daily; both responded later to marmite.

Summary

1. Clinical trials of various preparations containing vitamins B_1, B_2, and B_4, failed to show that any of these vitamins have hæmopoietic properties in tropical macrocytic anæmias.

2. Marmite, an autolysed yeast product, was active curatively in similar cases.

3. The hæmopoietic factor in marmite was soluble in water, and 80 per cent. alcohol, and heat-stable.

I have to thank the medical superintendents and the staffs of the following hospitals in Bombay for facilities and permission to use their patients: the Cama and Albless Hospital, the Goculdas Tejpal Hospital; the Jamasetje Jeejebhai Hospital, and the Motlebai Hospital. Further, I have to thank the director of the Haffkine Institute for permission to work there, and for his interest in the work, and my assistant, Mrs. Talpade, M.B., for her help.

The analyses of the precipitate in the alcoholic extract of marmite were kindly done by Dr. Malankar, of the biochemical department of the Haffkine Institute, and will be reported in the *Indian Journal of Medical Research*, where fuller details of all the work described above will be given.

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Clinical and Laboratory Notes

A CASE OF PERNICIOUS ANÆMIA TREATED WITH VITAMIN B_2 FROM EGG WHITE

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AND

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THE following case is of interest in view of the results reported by one of us (see p. 1283) on the nature of the hæmopoietic factor in marmite.

A woman of 45, suffering from uncomplicated idiopathic pernicious anæmia, was treated with an extract of egg white, with a view to testing the hypothesis that vitamin B_2 is W. B. Castle's extrinsic factor.[1] This extract, a good source of vitamin B_2, free from vitamin B_1, was placed at our disposal through the kindness of Miss Harriette Chick, D.Sc., and her co-workers at the Lister Institute. The daily rat dose of this extract is 0·5–1·0 c.cm., which is equivalent to 0·5–1·0 g. of egg white. In tropical macrocytic anæmia the curative dose of marmite was found by one of us[2] to be forty times the rat dose; 40 c.cm. of the egg white extract was therefore judged to be an appropriate dose for trial in the case under consideration.

After a control period with no treatment, the patient received first the extract alone, and then the extract after incubation with 150 c.cm. of normal human gastric juice, this juice containing acid and pepsin as laid down by Castle and his co-workers.[3] The mixture of gastric juice and the egg white mixture had a pH of 2·0 or more; it was adjusted to between pH 2 and pH 3 and then incubated for two hours with frequent stirring. The mixture was then brought to pH 5·0 and given immediately to the patient, who took it readily by mouth. As is shown in the Table, there was no response to this method of treatment, but a steady deterioration in the patient's blood and clinical condition. Rapid improvement, with a typical reticulocyte response, followed the administration of liver extract.

These findings provide further evidence in support of the opinion, expressed in the previous paper, that the extrinsic factor of Castle and Strauss is not vitamin B_2 but some other factor, as yet undetermined, which is present in both animal protein and marmite.

Days.	RBC per c.mm.	Hb. per cent.*	Reticulocytes per cent.	Treatment.
		PERIOD 1		
1 month before.	2,541,000	56	..	Nil.
1	2,260,000	50	0·9	
2	..	..	..	
3	1,875,000	..	0·7	
		PERIOD 2		
1	..	46	0·4	Egg white extract 40 c.cm. daily.
2	..	46	..	
3	..	44	0·9	
4	..	44	1·0	
5	1,575,000	43	0·8	
6	..	43	0·2	
7	..	42	0·9	
8	..	40	0·6	
9	..	40	0·9	
10	1,488,000	39	0·6	
		PERIOD 3		
1	..	39	..	Egg white extract 40 c.cm. incubated with 150 c.cm. normal gastric juice.
2	..	38	0·9	
3	1,452,000	38	1·4	
4	..	..	0·9	
5	..	38	2·0	
6	..	36	0·9	
7	..	34	1·1	
8	..	..	1·0	
9	1,350,000	32	0·9	Too ill to continue treatment.
		PERIOD 4		
1	1,187,000	30	1·0	Liver extract equivalent to 1 lb. liver daily.
2	..	30	1·5	
3	..	34	2·0	
4	..	36	7·1	
5	1,462,000	39	16·0	
6	..	..	19·5	
7	..	44	25·6	
8	..	44	17·5	
9	1,925,000	50	11·0	
10	..	..	5·8	

* 100 per cent. = 13·8 g. per 100 c.cm.

We wish to thank Dr. D. C. Hare for permission to treat her case, and the volunteers who gave their gastric juice.

EARLY SYPHILIS RESISTANT TO ARSENIC TREATED WITH SULFOSIN

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A MAN of 29 was sent to me on Nov. 10th, 1931, on account of balanitis accompanied by enlargement of lymphatic glands.

His *history* was that he had been exposed to venereal infection in Paris on August 27th. Seven weeks later he noticed a balanitis, but as he had often had this condition before he ascribed it to a septic state due to a tight prepuce. He treated himself with strong antiseptics and produced an acute inflammation.

On *examination* there was a painful septic balanitis, and near the frænum a small sore with only slight induration. The only other sign then present was discrete, painless enlargement of the inguinal glands on both sides. There was no other adenitis, no skin lesion, and no involvement of mucous membranes.

After dressing with saline for three days spirochætes were easily found in fair numbers. The Wassermann reaction was positive with 34 units, and Table I. shows its subsequent behaviour under various forms of treatment.

The urine was free of albumin and remained so during the time he was under treatment. During the next seven

[1] THE LANCET, 1932, ii., 111.
[2] Brit. Med. Jour., 1931, i., 1059.
[3] Amer. Jour. Med. Sci., 1929, clxxviii., 748, 764; 1930, clxxx., 305; 1931, clxxxii., 741.

weeks I gave him 4·8 g. of neokharsivan intravenously and 1·6 g. of thiobismol intramuscularly. All lesions healed completely and the Wassermann became negative. He was to come for a further course of treatment in six weeks' time. On Jan. 19th, 1932, 18 days after the last injection, he returned with a profuse rash of an impetiginous nature on scalp, face, and limbs. Those on the limbs were dark and had a scaly surface resembling psoriasis. Most of the fingers of both hands showed septic foci, which the patient stated began as blisters. The Wassermann was still negative. As none of the lesions was definitely syphilitic and the Wassermann was negative the rash was at first thought to have some relation to arsenic and appropriate treatment given. By Jan. 22nd the rash became more pronounced, and unmistakable gummata appeared on the sole of the right foot, right instep, sole of the left foot, and several fingers of both hands. Tab. thyroid (fresh gland) gr. ½ and liq. hyd. perchlor. ℥ i., pot. iod. grs. 5 were given three times a day. The lesions on the hands healed superficially, but lumps could be felt under the skin.

On Jan. 28th and Feb. 5th the Wassermann was barely positive with 7 units. A small dose of neokharsivan (0·15 g.) was tried and in five days time all lesions were rather worse. From Feb. 10th until March 18th 4 g. of thiobismol were given intramuscularly and the pot. iod. was increased to grs. 45 three times a day without producing iodism. The effect of this drastic treatment was to improve the condition, although complete healing did not take place. The Wassermann was still just positive with 7 units on April 8th. The patient was to continue to take pot. iod. grs. 30 and pil. hyd. c. cret. gr. 1 three times a day, and to see me again in a month's time.

By April 29th the pot. iod. seemed to have ceased to act and he reappeared in as bad a state as ever. I tried one more dose (0·75 g.) of neokharsivan accompanied by three injections of thiobismol 0·4 g., but the condition remained obstinate. It was then decided to try to get the patient under the influence of mercury, and mercurial inunction was given for 30 days by an experienced rubber. At the beginning of the course six injections of intravenous mercuric iodide and pot. iod. were given as recommended by Spittel.[1] Mercurialism was evidenced by soreness of the gums and slight diarrhœa. During the last 14 days of this treatment the patient was kept in bed in a nursing-home, and all the dressings changed frequently. When he left the nursing-home all lesions had practically healed, but within a fortnight they were as bad as ever. Ionization with pot. iod. and various ointments had no effect.

On August 6th he had to return to the nursing-home as the condition of the feet prevented locomotion. During these eight months, during which he had been under treatment, the general nutrition had not suffered, and apart from the discomfort of having to wear dressings on hands and feet the condition of the patient was good. With rest and constant dressing with lotio nigra all the foci of infection became cleaner. The blood count was normal except for a small drop in the number of leucocytes which was 5000 per c.mm. The Wassermann was positive with 100 units.

At 11.30 A.M. on August 12th I gave an injection of 1 c.cm. of Sulfosin (Leo) into the muscles of the upper third of the right thigh. Exactly 12 hours later the temperature rose to 104° F. and gradually subsided by August 14th. On the 15th a second injection was given into the left thigh, and in 12 hours the temperature rose to 103° and subsided as before. At 11 A.M. on August 16th, when the temperature was 101°, the leucocytes were counted again and found to be 18,000 per cm. with 88 per cent. polymorphonuclears. A third injection of 1 c.cm. of sulfosin produced a temperature of 103·6°. By August 19th all the lesions had healed with the exception of a small crack at the right angle of the mouth.

On August 23rd 0·75 g. of neokharsivan intravenously was again tried, and this time it acted as it does in non-resistant cases and the mouth had healed in 48 hours. On August 27th the patient had to leave the home to go on a voyage so there was no opportunity to continue treatment. He was seen again on Sept. 19th, and all lesions had remained healed with the exception of the crack at the angle of the mouth and the sole of the left foot. The Wassermann was positive with 41 units. The leucocyte count was 12,000. Neokharsivan 2·55 g. and thiobismol 1·6 g. were given, but had little effect. On Oct. 19th the leucocyte count was 7000 per cm. Another injection of sulfosin 1 c.cm. was given on Oct. 21st, and it produced a temperature of 101·8° and a rise of the leucocytes to 12,000. This was followed by 1·35 g. of neokharsivan and 0·8 g. of thiobismol and 15 mercurial rubbings. Healing was not yet sound, so on Dec. 16th a fifth injection of sulfosin 3 c.cm. was given, producing a temperature of 101·4° and a leucocyte count of 13,000. This was followed by 2·70 g. of Kharsulphan and 2·4 g. of thiobismol, both intramuscularly. On Feb. 2nd, 1933, every lesion was soundly healed, but the Wassermann remained weakly positive. Later the Wassermann again relapsed with a positive reaction of 37 units, and the development of a superficial ulcer on the outer side of the left ankle. The hopeful thing about this relapse was the fact that the patient seemed to react normally by the production of a positive Wassermann corresponding to a definite syphilitic lesion. Kharsulphan 3·75 g. and thiobismol 3·2 g. were given intramuscularly; the ulcer healed quickly and the final Wassermann (June, 1933) was weakly positive with 7 units.

TABLE I.—*Changes in Wassermann in Relation to Clinical Data*

Date.	Wassermann.	Clinical data.
Nov. 13th, 1931.	Pos., units 34.	Before treatment.
Jan. 10th, 1932.	Complete neg.	After first course of treatment.
,, 19th, ,,	,, ,,	Profuse syphilitic rash with gumma formation.
,, 28th, ,,	Weak pos., units 8.	Under constant treatment; clinical signs marked.
Feb. 5th, ,,	,, ,, ,, 7.	
Feb. 23rd, ,,	,, ,, ,, 6.	
April 8th, ,,	,, ,, ,, 12.	
Aug. 12th, ,,	Strong pos., ,, 100.	Just before sulfosin injection.
,, 23rd, ,,	,, ,, ,, 100.	After third injection of sulfosin.
Sept. 19th, ,,	Pos., ,, 41.	After three weeks without treatment.
Oct. 21st, ,,	,, ,, 27.	Slight symptoms still. Sulfosin again.
Dec. 4th, ,,	Weak pos., ,, 9.	—
Feb. 2nd, 1933.	,, ,, ,, 12.	Clear of symptoms.

TABLE II.—*Dosage and Effect of Sulfosin*

Date in 1932.	Dose (c.cm.).	Max. temp. F.	Leucocytes per c.mm.	
			Before inject.	After inject.
Aug. 12th ..	1	104	5,000	18,000
,, 15th ..	1	103·4	—	—
,, 18th ..	1	103·6	—	—
Oct. 21st ..	1	101·8	7,000	12,000
Dec. 16th ..	3	101·4	—	13,000

DISCUSSION

It is clear that this case can be classed with the so-called arsenic-resistant cases, and bears out Gougerot's contention that they are often resistant to bismuth and mercury as well. The condition has been noted in France and Germany for some years, and to a less extent in America, but appears to have been noticed only recently in this country.

In early syphilis the lesions either do not clear up in spite of large doses of 914, up to as much as 6 g.[2] during the first few weeks of treatment, or, after clearing up, reappear in a few weeks in an exaggerated form. In the former variety spirochætes have been found in the lesions after the administration of these large doses.[3] The importance of the resistant case lies in the fact that there is less certainty of destroying surface spirochætes than there used to be, and there is therefore more chance of an infected person passing on his disease during the early stages of treatment.

Since the introduction of Ehrlich's preparations the possibility of producing an arsenic-fast spirochæte has been realised, but it is uncertain whether this has occurred. A gradual resistance of syphilis to arsenic has been noted by Silberstein,[4] for during the period 1911–16 he found that the Wassermann reaction became negative in 85 per cent. of cases, whereas between 1921–22 only 25 per cent. became negative. It has been suggested that our knowledge of the subject might be increased by a study of the

type of syphilis with which a resistant case infects a fresh person, but there seems to be no constant sequence. It appears that a resistant form may be passed on as a resistant [5 6] form; a resistant form may give rise to a non-resistant syphilis [7] and again a non-resistant syphilis may produce a resistant syphilis.[8] Lastly, abortive or preventive treatment may fail on account of resistance.[9]

The drug does not seem to have undergone any change, and, indeed, in most cases is as efficient as ever, as reported by Drake and Thomson.[10] It is held by some that the manufacturers have reduced the toxicity of the drug to the patient, and have thereby diminished its spirochæticidal power. There is no evidence of any such change, although accidents due to arsenic do not appear to be reported as frequently as formerly, nor are nitritoid reactions seen as often.

As in the case reported and many others on record, the Wassermann reaction is either negative or weakly positive, even in the presence of the most manifest signs of syphilis. It is not uncommon for the reaction to become strongly positive as the result of treatment, and from that time symptoms begin to disappear. Schroeder [11] mentions that he has seen the reaction become strongly positive after the first few injections of sulfosin, and this he ascribes to a "biological" reaction. Other substances have a similar effect, as reported by Rosner.[12] In this instance the change was brought about by intradermal injections of luotestin (0·2 c.cm.), which is a vaccine prepared from chancres in rabbits. After injection the reaction changed from negative to positive, and such a small dose as 0·15 g. of neosalvarsan was sufficient to clear all lesions at once.

It almost looks as though the reaction of the patient necessary to produce a positive Wasserman were some help to therapeutic measures.

The series of papers published in THE LANCET on sulfosin in the treatment of neurosyphilis [13] was suggestive, and as Schroeder had advocated its use in all forms of syphilis I decided to give it a trial. It is not meant to suggest that sulfosin, or any other form of sulphur, is certain to be of use in resistant cases, but there are several points in its favour and it is certainly worthy of a trial in these difficult cases. The method is easily and safely carried out; the length of time between the injection and the rise of temperature is constant; there is little uncertainty as to its action, and it has the advantage over malarial therapy that the nervous patient cannot object on the score that he is being given another disease.

It is best given in the evening so as to avoid disturbing the patient at night. Although 1 c.cm. is sufficient to produce a reaction the dose may have to be increased to 5 or even 10 c.cm.

Sulphur is used on account of its pyrotherapeutic value, but it is possible that it may exercise some specific action which it was supposed to possess at one time. Power [14] shows that it has a powerful effect on the leucocytes producing at times a leucocytosis amounting to 40,000 per c.mm.

Another method of treatment is by intravenous cyanide of mercury, which is said to be successful by French authors. This is fully described by Lane,[15] who used it in combination with 606 as a routine treatment, but not as a means of dealing with arsenic-resistant cases. But in the case recorded above it is doubtful whether it would have acted, since mercurial inunction has no effect.

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CORRIGENDUM.—In Dr. W. J. Pearson's post-graduate lecture published last week (p. 1251) the third line under the heading of Chronic Idiopathic Epilepsy should read "when they cease during *pyrexial* attacks, . . ."

MEDICAL SOCIETIES

SOCIETY OF MEDICAL OFFICERS OF HEALTH

A MEETING of the metropolitan division of this society was held on May 26th, with Dr. JAMES FENTON in the chair; members of the food group of the Society of Chemical Industry were present as guests.

Dr. H. HALDIN-DAVIS gave an address on the prevention of

Industrial Diseases of the Skin

The chief industrial diseases of the skin, he said, were anthrax, the most dramatic and perhaps the least common; cancer of the skin; and trade dermatitis. Not less than 15,000 cases of dermatitis were certified by factory surgeons every year. The workers most frequently attacked were engineers, bakers, flour and sugar confectioners, french polishers, workers in the fur trade, and in chemical and dyeing industries. Domestic workers were also likely to suffer from the use of soda and other alkalis. The macerating effects of soap, soda and water on the thin skin round the nails rendered these workers liable to a chronic type of onychia.

All matters concerning the health of the factory worker, he continued, were dealt with by the Home Office. The original order of 1907 awarded compensation for "eczematous ulceration of the skin produced by dust or caustic or corrosive liquids, or ulceration of the mucous membrane of the nose or mouth by dust." In 1916 the term "dermatitis" was first introduced and made a subject for compensation when caused by dust or liquid. Dermatitis was not a notifiable disease; the Home Office held that notification would not increase their information about the disease, and would add to the expense of administration. The only notifiable skin diseases were: anthrax; epitheliomatous ulceration due to tar, pitch, bitumen, mineral oil, or paraffin; and chromic ulceration. For the prevention of anthrax reliance was placed on preliminary disinfection of the raw material and proper conditions of employment. If diagnosed early, anthrax was amenable to treatment, and a precautionary card was issued by the Home Office and given to any workman who developed a pimple or sore to take with him to his doctor. On the card there were pictures of early anthrax lesions, which tactfully served to draw the doctor's attention

to the possibility of the disease. The workers most likely to be affected with skin cancer were mule-spinners and those concerned in the distillation of coal tar, the manufacture of patent fuel, or the refining of paraffin oils. The committee on epitheliomatous ulceration in mule-spinners, whose report was published in 1926 by the Home Office, recommended: (1) the provision of an innocuous oil, but did not name any particular brand; (2) adequate protection of the workers against contamination by the provision of antisplash screens and non-splash bearings; (3) scrupulous cleanliness and the early removal of oil by washing; (4) regular medical inspection of workers with a view to early diagnosis. The early stages of cancer of the skin were decidedly amenable to treatment. These recommendations were also applicable to others who worked under conditions likely to produce cancer of the skin. A warning placard had been prepared, setting out the precautions necessary for the prevention of oil dermatitis, which was one of the precursors of epithelioma.

Chromium compounds were, he said, extremely dangerous to the skin and mucous membrane, and in recent years their use had increased owing to the development of chromium plating. Chromium produced ulcers on the skin known as "chrome holes," and a characteristic lesion was perforation of the nasal septum. Home Office regulations were directed to: (1) provision of an efficient exhaust draught to carry off fumes; (2) maintenance of smooth, impervious floors in work-rooms so that no pools could collect and no fluid could drip through on to workers below; (3) provision of rubber gloves, boots, and aprons; and (4) proper lavatory accommodation with a supply of hot water. Cautionary placards were posted up in factories, and regular medical inspection was compulsory.

Dermatitis was most common in the food industry among bakers, confectioners, and jam makers. The first factor in prevention was to select carefully the personnel employed; those with skin diseases or ichthyosis were excluded. In theory it would be advisable to test every candidate for idiosyncrasy towards the substances with which he was to come in contact, but this seemed to be impossible. In certain trades employers were compelled to provide proper washing facilities and to exhibit cautionary notices. Inspection was important because it enabled skin troubles to be detected at an early stage, while still amenable to treatment. Dr. Howard Mummery advised removal of the irritant and prohibition of washing while any sign of dermatitis was present. Manicure was provided free for employees where special cleanliness was desirable. It had been suggested that bowls of weak antiseptic should be placed on the benches for workers to dip their hands in, but the antiseptic tended to get into the food, and in any case dermatitis in these workers was due to a chemical action, not to sepsis. The use of gloves was hardly practicable in the food trades, but they were useful in some occupations. They were more popular in America than in England. Rubber gloves prevented the evaporation of sweat, which was itself an irritant and a cause of dermatitis. They were chiefly valuable among those who had to deal with electrical apparatus.

Special solvents were sometimes used for adherent material; the Home Office recommended a wash containing chlorinated lime, sodium bicarbonate, boric acid, and water. One firm (Rosalex) had produced a preparation which formed a film on the hands and protected them against injurious substances. The worker received more consideration in regard to industrial diseases in England than in other countries, and the advantages of State action had been amply proved and justified.

DISCUSSION

Dr. N. HOWARD MUMMERY said that he examined some hundreds of normal skins every month, and saw the dermatoses in their earliest stages. The dermatoses seen in industry, with a few exceptions, were not peculiar to the occupations involved, nor were they more common among industrial employees than among the rest of the community. True industrial dermatitis was uncommon, for though nearly every occupation exposed the worker to some irritant, he often handled the same substance in his home. The highest incidence of skin diseases among the workers under Dr. Mummery's care was during June, July, and August, and was undoubtedly accounted for by the increased activity during those months of the sweat glands, which predisposed to dermatitis. Though in theory all new workers should be tested for their reaction to trade irritants, such tests were of limited utility, as they disclosed only those who were already sensitised, and could not detect those who might later become so. Moreover, the reaction to any given irritant varied with the skin state and was not a constant or typical lesion in a single patient. A girl might work for years at a job without any skin trouble, and then become highly sensitive to the irritant; after some months she might again become immune to it. Cotton seed oil was a good substitute for raw paraffin or turpentine for removing paint from the hands. Small repeated exposure to X rays was effective not only in clearing up industrial eczema but in preventing relapses. Such doses seemed definitely to reduce susceptibility.

Dr. G. CLARK TROTTER emphasised again the point, made by Dr. Howard Mummery, that the ordinary population showed a certain incidence of dermatitis and eczema, and that a corresponding proportion of cases must be disregarded when assessing the incidence of industrial dermatoses. He called attention to the value of the Home Office museum in Westminster to those interested in this subject.

Prof. H. RAISTRICK asked whether Dr. Haldin-Davis had experience of the severe dermatitis caused by nitro-compounds, particularly tetryl.

Dr. HALDIN-DAVIS agreed that X rays produced rapid improvement in resistant cases of dermatitis, and that they reduced susceptibility to relapse. He had no experience of the effects of nitro-compounds.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY

AT a meeting of this society held on June 8th at 11, Chandos-street, W., with Dr. O. H. WOODCOCK in the chair, Dr. F. G. CROOKSHANK read a paper on

Individual Psychology and Nietzsche

He pointed out that the psychological movement of the last 30 or 40 years has its source in the Nietzschean revolt against the whole artificial structure of categories, classes, causes, and concepts set up in the nineteenth century upon a basis of mediævalism. This earlier psychology, founded upon the separation of human beings from one another in terms of differences, contrasts with the new psychology which is based upon the recognition of what we have in common with one another as human—all too human—men and women. Much as Freud

and Jung owe to Nietzsche, he said, the bond between Nietzsche and Adler is particularly close. Not only do both consider that purpose is the mainspring of action, but Nietzsche in one of his earliest works sees in the Will to Power—that fundamental of individual psychology—the motive force in all living phenomena. The Nietzschean philosophy regards pain as the greatest educator and ennobling force in Nature; here is the germ of Adler's doctrine of the overcoming of weakness by courageous effort. Again Nietzsche, like Adler, emphasises the relation between physical ill-health and emotional feeling, especially resentment, and elsewhere he foreshadows Adler's doctrine of compensation.

Not that all individual psychology is to be found, even in embryo, in Nietzsche's writings; we miss in them much that we rightly claim as Adler's positive contribution. Nor is individual psychology's debt to Nietzsche consciously incurred. Rather do Nietzsche and Adler constitute a sequence in becoming, just as dawn follows night, a sequence in the phantasmagoria of life. Nietzsche failed in his own life, partly because he carried his revolt of the individual to such a pitch that he, the super-individual, became mad as a result of his self-isolation. Adler, on the other hand, considers that the essence of sanity lies in the relation of the individual to the community, and to that extent individual rights are subordinate to social rights. Nietzsche glorified the strong for their strength, and despised the weak for their weakness. Individual psychology spells encouragement for all, weak and strong alike. The seeming paradox here is in keeping with individual psychology, which is itself a paradox from beginning to end. Called individual psychology, and rightly, it is nevertheless the first and best, if not the only social psychology.

DISCUSSION

Mr. A. LUDOVICI remarked that certain factors separated Nietzsche definitely from Adler. Nietzsche would have asked if it is necessary to allege that the neuroses result from a revolt against society. His attack was against Plato and Socrates. He fought against dualism, against the transvaluation of values which enabled men to excuse appearance. Disease and abnormality were disfigurements. Morality was largely a matter of taste. Nowhere did Adler ask a question of this sort. Nietzsche would ask with whom were we to coöperate.

Dr. J. C. YOUNG pointed out that consideration of the Nietzschean philosophy is of value when dealing with the schools of Freud, Adler, and Jung. Much that Nietzsche prophesied had come to pass. Adler lived in the post-war period; the question of the people with whom coöperation was demanded had to that extent changed. The question was largely a matter of emphasis.

Dr. S. VERE PEARSON said that 45 years had passed since the publication of Nietzsche's last work. The idea of Christianity had changed since then—Nietzsche's attack was on the church of his day. It was now recognised that men are not equal—it was equality of opportunity that was required. In Nietzsche's day this idea was not prevalent.

Dr. A. SANDISON agreed that psychology and philosophy were possibly matters of taste. But it was not so, so far as fundamental truths are concerned.

Dr. CROOKSHANK explained that though Adler differed in some respects from Nietzsche, yet always he continued his line of thought. Individual psychology worked pragmatically, Adler's psychology was justified practically; his patients got well. Nietzsche opposed academic Christianity. In individual psychology the question of taste did not arise.

The CHAIRMAN indicated that Adler was concerned with the present situation. He was an emergent philosopher and he stressed the concepts which appeared to be true.

REVIEWS AND NOTICES OF BOOKS

1. The Diabetic Life

Seventh edition. By R. D. LAWRENCE, M.A., M.D., F.R.C.P. Lond., Physician in charge Diabetic Department, King's College Hospital; late Chemical Pathologist and Lecturer in Chemical Pathology, King's College Hospital. London: J. and A. Churchill. 1933. Pp. 218. 8s. 6d.

2. The Diabetic A B C

Second edition. Same author. London: H. K. Lewis and Co., Ltd. Pp. 56. 3s. 6d.

1. The chief change which has occurred in the new edition of this popular book is the discussion of the increase in the carbohydrate values. Dr. Lawrence has doubled the carbohydrate value of his Line Ration, so that a patient taking ten Lines would now receive carbohydrate 100 g., protein 75 g., and fat 150 g. Dr. Lawrence uses a diet of 80 to 100 grammes of carbohydrate by preference, but occasionally allows as much as 150 grammes if the patient desires it. The amount of fat has not been altered, and is therefore very high compared with the amounts used by the advocates of the high carbohydrate-low fat diets (carbohydrate 250 g., fat 50 g.), and is half as much again as that used by Dr. Priscilla White in Boston. Dr. Lawrence has not, apparently, noticed any decrease in the insulin requirements following an increase in the carbohydrate. A disadvantage of the doubling of the carbohydrate in the black Lines is that now neither the carbohydrate nor protein values correspond with the values used in the food tables, which are still kept in terms of 5 grammes of carbohydrate and 5 grammes of protein. The value of this book has long been established and it needs no recommendation to those who have handled it.

2. Practically the only change in the new edition of this book, which is admirably suited for the guidance of patients with or without a high standard of education, is the doubling of the carbohydrate values in the Line Ration. A few additional recipes have been included.

Diabetes in Childhood and Adolescence

By PRISCILLA WHITE, M.D., Physician at the New England Deaconess Hospital, Boston, Massachusetts. London: Henry Kimpton. 1933. Pp. 236. 18s.

THIS small monograph on the diabetic child corresponds in scope to the larger book on diabetes in adults, written by her teacher, Dr. E. P. Joslin, and is based on an analysis of 750 cases. It is not very easy to read, as it is packed full of information; but it well repays the labour.

The chapter on heredity offers evidence that diabetes is inherited as a recessive character. The number of recorded cases of twins with diabetes is now 13; in three pairs the onset of the disease was simultaneous, while the longest interval was as great as 48 years.

The optimal amount of carbohydrate for the diabetic is still unsettled. Dr. White uses a diet which is not extreme. Thus for a child of 10, weighing 62 lb., the carbohydrate might vary between 105 and 210 g., the protein between 42 and 48 g., and the fat between 65 and 121 g., whereas the ideal diet of the Boston school would be C. 135 g., P. 70 g., F. 90 g. Dr. White avoids not only the very high carbohydrate values, but also the very low fat values. The amount of carbohydrate in her diet (4 g. per kg.) is a little more than the minimal amount of carbohydrate, 3 g. per kg. recommended by W. M. Marriott for a healthy child, but considerably less than the figure usually regarded as optimal, 10–15 g. per kg. Dr. White prefers the lower figure for the carbohydrate, because less insulin is necessary, and the dangers of hypoglycæmia are less if a meal is omitted. She also makes the point that it is very easy to add extra fat to a diet which is only supposed to contain 50 g. and thus unbalance the diet. She does not comment on the inconvenience of the very low fat diet. The change to the diet, now in routine use with a reduction of the fat to less than 50 per cent. of the total calories, has caused a drop in the cholesterol content of the blood in her patients. The mean value in the blood of 234 patients is now only 183 mg. per 100 c.cm. instead of 228 mg. per 100 c.cm. in 1926. There was previously a tendency for the cholesterol to increase the longer the diabetes lasted, and it will be interesting to see if this observation still holds good now that the composition of the diet is altered.

One of the factors which lead to the high carbohydrate-low fat diet was the observation that atheroma and arterio-sclerosis were present in some patients, and Dr. White's figures are certainly striking in this regard. Nineteen out of 104 children showed some signs of calcification of the leg arteries under the X rays, and five others showed retinal sclerosis. One adolescent of 28 had well-marked calcification of the leg arteries. The changes at autopsy were interesting. Out of 11 cases, six showed definite plaques of atheroma on the aorta or coronary artery, and arterio-sclerosis was present in the other five. The child with the most marked changes was only 12 years old, and had had diabetes for four years. This finding is a very serious one, and suggests that the diabetic may suffer severely from arterial disease. Patients who have high blood-sugars are especially liable to be affected, and also those who are treated with a high fat diet. The discovery of the best balance of the fat and carbohydrate is, therefore, of the utmost importance. Fifteen patients showed early signs of cataract—in the form of numerous highly refractile crystals. None has so far required operation.

Most of the children have done well, and have passed through puberty successfully. Ten have married; seven have had healthy children, and so far none of these has developed diabetes. The arrangements made for a "wandering diabetic nurse" to visit patients (and their doctors), who live in remote districts, appear to be admirable, and the summer camps organised for diabetic children should not only help to improve the children's health, but also give the parents a rest from continual supervision of diets and insulin.

Where so much is good, attention may be drawn to sundry errors. Thomas Willis noticed the sweet taste of the urine of a diabetic in 1675, not 1775. A "not" has crept into the statement that should read "Phloridzin glycosuria is renal in origin." C. von Pirquet worked in Austria, not in England. Best's name is omitted in the description of the early work on the discovery of insulin, though it is mentioned subsequently. E. A. Carmichael's name is given as Cammidge in the text, though the reference is correct. These and other mistakes will doubtless be corrected in a second edition.

The Adjustment of Muscular Habits

By Lieut.-Colonel JAMES MCCONNEL, D.S.O., M.C. With a foreword by W. E. LE GROS CLARK, D.Sc., F.R.C.S. London: H. K. Lewis and Co., Ltd. 1933. Pp. 129. 4*s*. 6*d*.

IN this little book general lines of treatment are suggested for faulty muscular habits, whether arising from general maladjustment or as the secondary result of joint trauma. Many of the ideas as to the origin of the faults and the appropriate measures for correcting them occurred to the writer whilst conducting treatment of patients in the electrotherapeutic department at St. Thomas's Hospital, and the introductory remarks from Prof. Le Gros Clark justify the stress laid by the author on the psychological implications of bad muscular habits. The relative simplicity of much of the technique described should commend the work to all practitioners, but undoubtedly the reading has not been made easy by the author's style. The whole theme is handled largely from a psychological point of view, and the psychological element in the origin or confirmation of vicious muscular behaviour has not hitherto received much attention. The quotations from Hobhouse, Stout, McDougall, and others are pertinent to the arguments, but the force of some of the arguments and of the advice for therapeutic procedure is sometimes obscured by a complicated presentation. There is sound sense in what is said of the re-educational outlook, and the value of the patient's coöperation in the analysis of a bad habit is emphasised as assisting in cure by natural and utilitarian movements rather than by formal exercises. Where this happy result can be obtained without complete dependence upon formal drill much will be gained, and the more definitely that the responses of the patient throw light on the circumstances of his case the more clearly can explanatory encouragement be given. This is a sound little book, but it is not always easy to read.

Die intrakutane Kaninchenmethode

By CLAUS JENSEN. Copenhagen: Levin and Munksgaard. 1933. Pp. 211.

THIS interesting monograph is somewhat marred by the fact that its author has adopted what might be called the *parvum in multo* method of presentation, common enough in medical books and monographs in all parts of the world, but fortunately avoided as a rule by British writers on pathology. Dr. Jensen is an expert in practical immunology, and is a clear if not a concise exponent of immunological principles. Most of the material he has assembled will probably be familiar to those who contemplate undertaking the difficult biological technique of titrating toxin and antitoxin, but the more general portions of the work dealing with units of measurement and the principles of standardisation will interest any bacteriological reader. Dr. Jensen describes in detail the method of titration by intradermic tests on rabbits, a method which he himself has reduced to a formal technique, and gives a statistical analysis of the results of this method of titration. The results suggest

that by the intradermic rabbit method diphtheria toxin and antitoxin can be titrated to the same order of accuracy as by the Römer intradermic method in guinea-pigs as perfected by A. T. Glenny and his co-workers. It would be interesting to make a trial of the rival methods by submitting to Dr. Jensen and to Mr. Glenny a closely similar series of dilutions of toxin and antitoxin, the actual potency of which was only known to some third party. Only thus could it be determined which of the two workers, each expert in his own method, would in fact achieve the higher accuracy.

Synopsis of Surgery

Tenth edition. By E. W. HEY GROVES, M.S., M.D., B.Sc. Lond., F.R.C.S. Eng., Consulting Surgeon to the Bristol General Hospital; Emeritus Professor of Surgery, Bristol University. Bristol: John Wright and Sons, Ltd. 1933. Pp. 693. 17*s.* 6*d.*

WHEN Prof. Hey Groves wrote his small text-book of surgery he achieved the almost impossible task of making a synopsis readable. It soon became famous, and every edition has enhanced its reputation. In the tenth edition it is up to date; no omissions of any account are noticeable. The illustrations and the section on surgical anatomy which have appeared in the later editions have added greatly to their value. A new feature is a short section on amputations. In conjunction with a larger text-book this synopsis can be heartily recommended to the student. For revision purposes it is excellent.

Homogeneous X Radiation and Living Tissues

By WARNFORD MOPPETT, M.D., Ch.M. (Sydney). Sydney: Australasian Medical Publishing Co., Ltd. Pp. 133. 12*s.* 6*d.*

THE range of this book is wide—from the nature of the atom as exemplified in the researches of Prof. Neils Bohr to the treatment of cancer and the problems involved in it. Dr. Moppett says in his preface that he began "an investigation of the reactions of the allantoic membrane of the chick to homogeneous X radiation produced by crystal diffraction in 1924." He hopes that this book may serve to correlate the substance of papers published in various journals into a continuous and readable whole, and commends it to those who contemplate research work on similar lines and to medical practitioners and students who are interested in its future clinical application. Unfortunately the conclusions reached as a result of irradiating the allantoic membrane of the chick have little clinical bearing, though admittedly this criticism might be applied with equal truth to many investigations valuable from other aspects undertaken ostensibly in furtherance of cancer research.

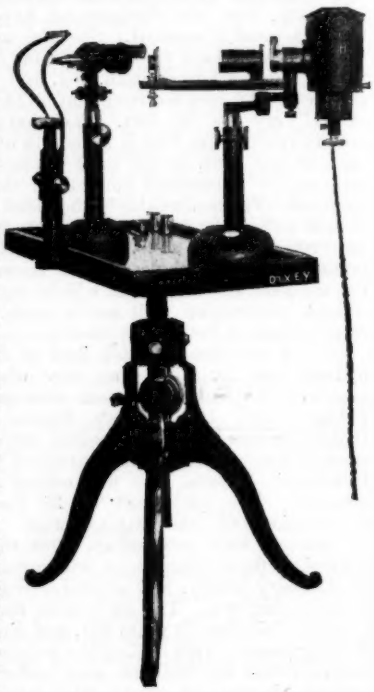
Dr. Moppett has much to say, in his introduction, of physical methods of measurement and the characteristics of ions. His way of approach rather resembles that of electrical particles, for he wanders from one subject to another, sometimes with positive changes which many readers will find stimulating, and at other times he seems to offer ideas only of negative value. If the reader is prepared to accept this desultory method of tackling such an important problem as the effect of irradiation on living tissues, he will find here much to interest him; but he will hardly fail to be disturbed by the lack of plan in the arrangement of the book and by the uncritical attitude which is manifest throughout its pages.

NEW INVENTIONS

AN IMPROVED SLIT-LAMP

THE slit-lamp has not hitherto been so widely used as its undoubted merits deserve, partly owing to its cost. Its value can only be appreciated by regular use and with the hope of inducing more of my colleagues to realise this I bring to their notice an instrument which can be supplied at half the price. It has now been in use for over 18 months, and having satisfied certain experienced slit-lamp observers may be said to be more than an experiment.

The light source is a "home cinema projection lamp" used direct on the house current without resistance. This is stocked by most electrical dealers. The optical system selects one of the filaments of the lamp grid and projects it in the Vogt manner, the beam being controlled by an adjustable slit, fine-adjustment focusing screw, and Arruga (vertical) screw in the usual manner. The selection of the filament is made in mounting the lamp in its housing; the selected position is maintained by two clamping screws and remains indefinitely. A feeble light is a source of much unrewarded slit-lamp observation, and replacement of the old Nernst lamp by the Nitra lamp (of thrice the light value) was a landmark in the history of the instrument. Taking the latter lamp as a standard, the system adopted has been found to give 91 per cent. of the light value from a Nitra source, at the point under examination, and this is adequate for all clinical purposes. For special purposes certain workers may require the highest degree of illumination obtainable; this is now provided for by an alternative lighting system, which, however, necessitates the use of a rheostat. The lamp and microscope are alike mounted on bases to slide on the glass-topped table. This method is less speedy than a mechanical device for lateral transit of the lamp, but it affords greater steadiness, and when the beam is adjusted it does not tend to pivot off its mark, so that there is no need to hold it constantly in position. The beam can be applied all round the stand, and I am obliged for a suggestion to this end made by Mr. Harrison Butler. The microscope affords a flat field, and the magnification of ×20 has been chosen as that of greatest usefulness for standard supply. Other magnifications are available (preferably by additional objectives), but are not required in routine work. If it is desired to study the endothelial cells the addition of objective 32 m.m. provides a magnification of ×28 which is suitable for this purpose.



The instrument has been made for me by Messrs. C. W. Dixey and Son, Ltd., of Old Bond-street, London, W., who were responsible for many devices for simplifying the mechanical design and for the successful means of cooling the 100 watt lamp.

E. GORDON MACKIE, M.B. St. And., D.O.M.S.

THE LANCET

LONDON: SATURDAY, JUNE 17, 1933

THE INHERITANCE OF IMMUNITY

IT is an everyday observation that many species are differentiated widely in their reaction to specific infecting organisms, and that these differences are constant and true-breeding. In addition it has been shown that inherited differences almost certainly exist, though of a less order, between breeds of the same species. For example, the Algerian sheep has been reported to be less susceptible than the European sheep to anthrax, while IDA PRITCHETT,[1] and later R. G. SCHOTT,[2] have shown that the albino mouse has a slightly higher resistance (as measured by mortality) than the brown or black coloured mouse when artificially infected with strains of mouse typhoid. There can be no reasonable doubt that individual differences in susceptibility to infection are likewise due, at least in part, to the influence of genetic factors. The difficulty lies in the measurement of this influence with any accuracy, in assessing whether in fact inheritance plays a major or a minor rôle in determining the initial infection or the subsequent death of the animal host. It is the usual problem of isolating inheritance from environment, the latter in this case comprising the transfer of passive immunity in utero and/or contact after birth with the specific infection and the consequent acquirement of a partial or complete active immunity. Prima facie there seems to be no valid reason why with controlled breeding it should not be possible to develop lines completely susceptible or completely resistant to a specific infection—or infections if the genetic characteristics should prove to be general rather than specific in their action. The amount of experimental work that has been carried out so far with this intent has, however, been somewhat meagre, and the greater part of it emanates from America and especially from L. T. WEBSTER and his co-workers on experimental epidemiology. Recently two important additions have been made to it in a series of six papers by M. R. IRWIN, of the University of Wisconsin, on Inheritance as a Factor in Resistance to an Infectious Disease,[3] and in two further detailed studies reported by WEBSTER himself from the Rockefeller Institute.[4]

IRWIN has adopted the rat as host and *Salmonella enteritidis* as infective parasite. His first test was the measurement of the reaction of an inbred albino strain, already past the fiftieth generation of brother-sister matings, to intraperitoneal injections of a fixed dose of the organism. A general uniformity of reaction to this particular infection was manifest; in other words, there was a fair approach to the ideal that is to be desired in a control stock. On the other hand, in spite of the long period of close inbreeding, some few litters still showed mortality-rates differing from the "normal" by more than could be ascribed to chance alone. When, in the next experiments, five different strains of rats were tested, significant though relatively small differences in susceptibility were revealed. The development of a stock with considerable resistance to the infection was achieved by breeding from survivors to the infection; these, when mated together, produced progeny containing twice as many individuals resistant to the infection as did the parent stock, the mortality amongst the original parental stock being 85 per cent., while that of the offspring of survivors was only 42 per cent. The inference is that survivors are those animals that are genetically endowed with powers of resistance superior to the average and transmit these powers to their offspring in the germ-plasm. More or less random mating among survivors over a series of generations was not, however, sufficient to maintain this high level of resistance; there was a tendency for the death-rate to rise in later generations, or, as IRWIN says, for an increase in proportionate deaths to be associated with close inbreeding. This result is somewhat at variance with the comparable work of LAMBERT on fowls,[5] and SCHOTT on mice,[2] since these workers found a resistance that tended to increase with each succeeding generation, a feature which has been interpreted as denoting an increasing segregation of genetic factors as opposed to the possible influences of acquired immunity. It will be observed in these experiments by IRWIN (and the same is true of nearly all experiments of this type) that the development of the resistant stock has depended upon breeding from *survivors to infection*. It follows that a rigid proof that acquired immunity is not a potent factor in the increased resistance of later generations is essential. This proof IRWIN endeavours to supply in a series of careful tests. For instance, he shows that the young of a surviving male mated to an untested female of known susceptible stock are resistant to the infection, "a clear-cut case against the presence of a transmitted passive immunity" which the male cannot pass on. It must, however, be noted that the surviving male may possibly infect his mate and thus pass immunity to his young. That such an event may occur, at least in some cases, is not an unreasonable belief. Similarly, the comparison of the resistance of offspring from carriers and non-carriers is not without its difficulties of interpretation. The validity of the comparison must of necessity depend upon the adequacy of the criteria by which the division of infected from non-infected is made, a division which W. W. C. TOPLEY and his associate workers have shown is not an easy one to carry out.[6] IRWIN'S results certainly suggest the presence of

[1] Jour. Exp. Med., 1925, xli., 195, and 1926, xliii., 161.
[2] Genetics, 1932, xvii., 203.
[3] Jour. of Immunology, 1933, xxiv., 285.
[4] Jour. Exp. Med., 1933, lvii., 793.
[5] Jour. of Immunology, 1932, xxiii., 229.
[6] Jour. of Hyg., 1924, xxii., 234, and 1924, xxiii., 223.

genetic factors but, generally, the conclusion must be that breeding from animals that have themselves survived infection necessarily leads to results, in succeeding generations, which are exceedingly difficult to interpret on genetic grounds with assurance. WEBSTER, in his latest experiments, has endeavoured to circumvent this difficulty by judging the parents according to the reaction of the progeny, parents whose first litters survived or succumbed at a chosen rate being selected for the breeding of further litters, and thus susceptible or resistant lines being built up. The Rockefeller Institute strain of mice formed the material for these studies and *B. enteritidis* was chosen as the infecting organism. Unselected mice injected intrastomachally with a standard dose of this organism suffered a death-rate of 37 per cent. "Susceptible" lines developed from the progeny of mice dying early after infection had death-rates of approximately 85 per cent., while by breeding from unexposed progeny of mice surviving infection "resistant" lines only 15 per cent. susceptible were obtained. In the latter case it must again be noted that the lines were originally developed from surviving animals (carefully selected for non-carriers), while in later generations the parents were not tested but, as in the susceptible lines, only chosen according to the mortality suffered by their offspring. Between different strains of mice very large differences in reaction were also revealed. For instance, of 164 white-faced mice 89 per cent. succumbed to the standard dose, while of the "Bagg" strain (albino) only 23 per cent. died out of the 452 tested. With such differences it should be possible to determine at least part of the genetic basis of immunity to this particular infection. WEBSTER, by crossing white-face susceptibles with resistant Rockefeller Institute mice, concludes that it is probable that resistance factors are dominant and not sex-linked, while both he and IRWIN find that weight at injection was correlated with the percentage mortality; but that in itself cannot be considered as having contributed more than a minor part to the differences in mortality observed.

An important point with regard to the genetic factor is the problem of its specificity or non-specificity. In previous papers WEBSTER has indicated,[7] on the basis of rather small-scale experiments, that mice that have proved resistant to an infective organism are also resistant to an injection of a toxic substance such as mercury bichloride. On the other hand, in his observations on the rat IRWIN reports that the incidence to the respiratory infection which is so common among rat colonies was practically equal among the resistant and susceptible strains. WEBSTER'S latest results are somewhat inconclusive. Of four lines of mice relatively susceptible to *B. enteritidis* three were likewise susceptible to *Pasteurella avicida*, *B. friedlaenderi*, and pneumococcus given intranasally, but the fourth was significantly more resistant. When these organisms were injected intraperitoneally or intravenously, no significant differences in duration of life of the several lines of mice could be demonstrated. Experiments with louping ill virus showed that of four lines relatively susceptible to *B. enteritidis* only two were susceptible to intranasal instillation of the virus, while lines resistant to *B. enteritidis* also proved relatively susceptible to the virus infection.

If the genetic factors involved in the production of individual immunity should prove to be non-specific, generally or even partially, this fact should prove of considerable value in disentangling inheritance from environment. It should enable the question of acquired immunity in the offspring to be eliminated, since having bred from the survivors to one infection the progeny can be tested for resistance with another unrelated organism or even with a toxic substance. Any method of attack must, however, as these experiments clearly show, be both laborious and time-consuming, and necessitate the use of large numbers of animals.

[7] Jour. Exp. Med., 1924, xxxix., 129, and 1925, xlii., 1.

PNEUMOTHORAX OR SANATORIUM OR BOTH

THE treatment of pulmonary tuberculosis by artificial pneumothorax has exhibited the sequence of popularity which seems to be almost the rule in clinical medicine. At first practised with extreme caution it gradually became of such wide application as to be in some institutions almost a routine procedure. Now the pendulum has begun to swing back, and at a meeting of the Tuberculosis Association recently reported in our columns[1] Dr. F. G. HEAF showed how the treatment was being applied without regard to its limitations and dangers. Some of these misapplications are the penalties of a success which has brought with it a readiness to apply the method without first counting the administrative cost. This cost includes the service of radiological and pathological departments, the complement of physicians up and down the country able to continue refills after the patients have left the institutions where the pneumothorax was induced, and long journeys for patients to the nearest refill centre—and the cost has not always been visualised. A patient too in the course of this prolonged treatment may have the refills carried out by several doctors in turn; responsibility is divided and the clinical picture obscured. In addition, as Dr. HEAF points out, there has been a steady increase in work at all tuberculosis institutions of recent years without a corresponding increase in staff. Twenty years ago fresh air, good food, and rest were practically the only ingredients of treatment; nowadays there are few cases not undergoing some form of special treatment—collapse therapy, intravenous injections—with additional calls on the time of the medical and nursing staffs. Faulty attention to details of technique may easily ensue. The beginner, Dr. HEAF says, is apt to regard the treatment as just putting air into the pleural cavity; the apparatus

[1] THE LANCET, May 27th, p. 1124.

is so simple and the needle so easily inserted. What is going on inside the thorax is less easily apprehended; whether the air is actually causing and maintaining collapse of the lung, or only pushing the mediastinum over towards the opposite side, or compressing the healthy lung. One fact indeed stands out most clearly, that is the amazing tolerance of the pleura and its resistance to accidental infection.

But when every allowance is made for enthusiastic misapplication there is still no question that artificial pneumothorax has added a new weapon to the treatment and control of tuberculosis and has come to stay. What then are its uses? Whole text-books have been written in answer to this question, and the Quarterly Cumulative Index Medicus contains nearly 300 references to this subject for the year 1932 alone. There appear to be two broad views which influence the physician's attitude: one school is impressed with the allergic response to a chronic infection treated on general lines, the other concentrates on the lesion in the lung. Dr. HEAF suggests that there has been a tendency of late to invert the logical sequence of thought. The question should not be—Can artificial pneumothorax be induced in this patient? but rather Can this patient recover without any form of interference? and the answer generally centres round that illusive conception "the early case," and the value of a wait-and-see policy. But here economic considerations may be paramount. Artificial pneumothorax may save the patient valuable time and often long residence in a sanatorium, with consequent economy for the State in bed accommodation. This attitude was put clearly from the point of view of the German State Insurance Scheme by Dr. GEORG KATZ,[2] who emphasised the social economies to be gained from the earlier return to work and the reduction of sputum-positive cases. In this country Dr. H. BATTY SHAW has taken the same line, as may be seen in a letter to our correspondence columns last week. He has advocated immediate collapse therapy, without a preliminary period of observation, for the wage-earner—especially the indoor worker—the parents of young children, and the poor, when the diagnosis of tuberculosis is confirmed by bacteriological or X ray manifestations or both. Dr. CEDRIC SHAW has made [3] a statistical analysis of cases attending Dr. BATTY SHAW'S clinic at the Brompton Hospital. His figures contain a percentage of early cases which in other hands would not have been subjected to lung collapse, and he compares them with those of Midhurst Sanatorium some years ago. The series was grouped, as in the Midhurst inquiry for the Medical Research Council by N. D. BARDSWELL and J. H. R. THOMPSON, into I., incipient; II., moderately advanced; III., far advanced. There were in all 267 cases; 184 went to a sanatorium after induction, 83 were treated by pneumothorax alone. The percentage mortality is almost the same, whether they had sanatorium treatment or not, in groups I. and III., but in group II. the "A.P.+sanatorium" class shows a slightly smaller mortality. The aggregate rates of mortality in the two classes are very similar; but when the sexes are separated, the rate for females treated by the combined methods is lower than that for those treated by pneumothorax alone. As to the working capacity and the residual symptoms of the survivors, the differences between the two classes are insignificant.

Of course the figures in the two series are too small to prove a superiority of artificial pneumothorax therapy over sanatorium treatment, but, clinical group for clinical group, the statistical differences between the two have led Dr. CEDRIC SHAW to conclude that active intervention holds out a better prospect of restoring working capacity than does sanatorium treatment, though this he recognises must remain a factor of importance from the educational point of view. He goes on to suggest that if a case can be made out for the superiority of artificial pneumothorax over sanatorium therapy, then on humane, social, economic, and public health grounds artificial pneumothorax in the individual patient should be undertaken earlier. In the past the grounds of opposition, he says, have been mainly two: (1) that the patient should be allowed a "chance to beat the disease" himself by a period of sanatorium treatment; (2) that artificial pneumothorax exposes the patient to a new and probably unnecessary set of dangers. These two objections, he considers, have been answered, in part or whole, by the figures set out in his article. But even those who welcome the statistical approach to this question can see that there are a number of imponderable factors on both sides of the equation. With all its drawbacks—and they are many and obvious—the sanatorium has established itself in the treatment of certain well-defined types of tuberculosis and any change of policy will need to be considered long and carefully.

[2] Die soziale und klinische Berechtigung zum künstlichen Pneumothorax im Kampf gegen die Tuberkulose, Leipzig, 1929.
[3] Quart. Jour. Med., April, 1933, p. 179.

SWIMMING BATH DANGERS

IT is a sound axiom that the first step towards solving a problem is to define it correctly. It is also wise, when an apparently satisfactory solution has been found, to go over the ground again and make sure exactly what it is that we have discovered. This applies to practical affairs at least as much as to the more theoretical aspects of medical science. A particular example is afforded by the practical problem of the disinfection of swimming baths. This is an appropriate season to refer to some recent observations which suggest that our routine methods of purification are subject to important limitations.

W. L. MALLMANN and W. CARY,[1] working in Detroit, U.S.A., have studied the results of chlorine and chloramine treatment of swimming-pool water in relation to the utilisation of the pool by bathers. They point out that the routine method of testing, in which specimens of water are withdrawn at

[1] Amer. Jour. Pub. Health, 1933, xxiii., 35.

various times and sent to a laboratory for bacteriological examination, afford no adequate index of the degree of pollution during periods of use; since, in the presence of free residual chlorine, the bactericidal effect is exerted during the time that elapses between the withdrawal of the sample and the preparation of the cultures. Their observations were made on the water of a swimming pool of 45,000 gallons capacity worked on the fill-and-draw principle, and a special laboratory was set up in the vicinity of the pool so that samples could be examined immediately on withdrawal. In a preliminary trial duplicate samples were taken at frequent intervals, one being examined immediately, the other several hours later. In one such trial the water was treated with chloramine. At 9.25 A.M., before bathing had commenced, the duplicate samples gave identical results. None of five tubes of 10 c.cm. of water contained lactose-fermenting organisms (acid and gas)—the so-called *B. coli* test—and no colonies appeared on the plates prepared for counting. Between 9.30 and 9.50 A.M. 30 men bathed in the pool; between 10.15 and 10.35 A.M. 37 men bathed. At 10.25 A.M. the second duplicate samples were taken. The sample examined immediately gave a presumptive *B. coli* test in each of five 10 c.cm. tubes, and a count of 65 bacteria per c.cm. The sample examined in the routine manner gave the same completely negative results that had been obtained before bathing commenced. Between 10.35 A.M. and 1.15 P.M. the pool was unused; 12 women bathed between 1.15 and 1.35 P.M. Samples taken between 10.50 A.M. and 2.30 P.M. and examined immediately gave the following *B. coli* readings: 10.50 A.M. five tubes all positive, 1 P.M. five tubes all negative, 1.30 P.M. four of five tubes positive, 2.30 P.M. five tubes all negative. The counts of viable bacteria gave comparable figures. All the duplicate samples, examined in the routine manner, gave completely negative results. In a considerable series of subsequent trials the degree of pollution was tested at frequent intervals, using the method of immediate examination and relating the result of each sample to the bathing load at the time when the sample was taken or at a known interval beforehand. In these trials examination was made for streptococci as well as for *B. coli*. The results showed clearly that, even in the presence of 4–5 parts of residual chlorine per million in chloramine-treated water, or of 2–5 parts per million in chlorine-treated water, wide fluctuations occurred in the degree of pollution in direct relation to the utilisation of the pool by bathers.

The contention of the authors, that the routine methods of examination of swimming-pool water treated with chlorine, chloramine, or any similar bactericidal substance may give an entirely false sense of security, would seem to be clearly established; and their recommendation that the source of error they have indicated should be removed by neutralising the free chlorine with sodium thiosulphate when the sample is collected—since routine testing at the bath side is obviously impossible—merits serious consideration. Without waiting for the information that such an improved method of testing will supply when used on an adequate scale, we may draw tentative conclusions that have an immediate bearing on an important practical problem. The chlorine and chloramine methods in common use would seem to be, as we had supposed, highly effective in freeing swimming-pool water from pollution within the space of a few hours. Observations recorded by MALLMANN and CARY suggest (*a*) that chlorine gives rather better results than chloramine, although the latter maintains the residual chlorine at the usually accepted figure over a longer interval; (*b*) that the pH of the water has a considerable influence on the efficacy of chlorination; and (*c*) that the maintenance of an adequate supply of free chlorine may demand frequent additions of the chlorinating agent. Given due attention to such points as these, we can so treat our water that there is a minimal risk of infection passing from one set of bathers to another who use the bath some hours later. Clearly this is an important gain, for the average risk of the passage of any dangerous infection will be significantly reduced.

What, apparently, we cannot do is to prevent, or reduce to insignificant proportions, the risk of infection passing from one person to another when both are using the bath at the same time. To particularise the problem still further: If a considerable number of school-children, some of whom are carrying a pathogenic micro-organism, such for instance as the hæmolytic streptococcus, bathe in company, there is an obvious risk of cross-infection, which must be particularly great when the organism is carried in the nasopharynx, for the playful bather is constantly getting mouth and nose filled with water which runs back into the common pool. This risk will not be obviated by chlorination or by any similar method of disinfection. The use of a school swimming bath during the prevalence of any infective disease will, therefore, appreciably increase the risk of the passage of infection within any group using the bath simultaneously, though adequate chlorination will probably lessen this risk to some extent, and will certainly reduce to relatively small proportions the risk of the passage of infection from one bathing group to another if intervals of an hour or more are allowed to elapse between the entry of successive groups. We should perhaps add that such a conclusion really involves a generalisation from a few bacterial species to bacteria in general, and that about virus diseases no directly relevant data are available. It would seem wise, however, to regard results such as those quoted as an indication of the minimal risks involved.

EPSOM COLLEGE MISSION.—In aid of the fund for the new stage at the Epsom College Mission, members of the College will perform Philip Massinger's comedy "A New Way to Pay Old Debts" on July 19th and 21st at 8 P.M. The first performance will take place in the Big School and the second at the College Mission, Lambeth-road, London, S.E. Tickets 2*s.*, 3*s.*, and 5*s.* each may be obtained from the secretary to the Mission Committee, Epsom College, Surrey.

ANNOTATIONS

HOSPITAL REFORM IN SCOTLAND

THE second report by the Scottish Consultative Council on Medical and Allied Services is as important as was its predecessor which appeared in 1920 under the title of A Scheme of Medical Service for Scotland (Cmd. 1039). The 12 years' interval has seen many administrative changes. The Board of Health, to which the first report was made, has gone the way of all administrative solecisms; but, after an interval, Sir Norman Walker is again chairman of the Consultative Council and this second report is animated by the same catholic spirit as was the first. To recapture the true background of these reports, it is necessary to go back to the Minority Report (1909) of the Poor-law Commission. It would be interesting to trace out the steps of this evolution of administrative proposals and to show their derivation from the "Break-up of the Poor-law." It is enough to say that, by the Munro report on A Reformed Local Authority for Health and Public Assistance (1923) and by The MacLean Committee's Report (1917), the way was cleared for the Local Government (Scotland) Act, 1929, which made possible the concentration of parish councils, education authorities, district committees, and district boards of control and the transfer of their functions to a single local authority. It was no easy task to carry this immense reform through; but the organisation of an adequate hospital service for all forms of sickness is one of the many good results of the new Act. One obstacle still remains—namely, the law of parochial settlement. It is now open to the new local authority to make a scheme that shall have no trace of poor-law stigma about it; but this alternative, although strongly recommended in the primary circular issued by the Department of Health, is not readily adopted by the new authorities; because, under the old poor-law statute, an authority can always "recover" outlays from the poor-law patient's parish of settlement, whereas under an approved scheme in terms of the 1929 Act, no such "recovery" is possible. Time, no doubt, will bring a solution; but this provision of the poor-law is, for the moment, a formidable obstacle to a radical readjustment, on the same public plane, of the public health, poor-law, and voluntary hospitals.

This report takes account of "settlement," though some of the recommendations are independent of it and the general policy of the department is that the poor-law management of sickness shall go. The voluntary hospitals are not willing to have their patients transferred to a hospital of lower social status. They are ready enough to accept the public health hospitals and maternity (public) hospitals as on the same social plane as themselves; but not the "pauper" hospitals. This creates a danger "that the voluntary hospitals and the local authority hospitals will develop along divergent lines. This would involve needless overlapping, duplication of equipment, staff, and administrative machinery, and would create difficult and serious problems which would stand in the way of an adequate hospital service. It would, in effect, produce two hospital systems." There should be only one; but this "does not involve absorption of one system by the other or any form of common control. It means no more than that all the hospital services in a given area, whether maintained by voluntary or by statutory authorities, shall be coördinated."

On this general groundwork the report indicates how the problems of coördination, allocation of patients, payment of patients, staffing, payment of staff, and teaching can be very simply solved. The document deserves most careful study. Meanwhile schemes are developing. In one hospital formerly devoted exclusively to poor-law patients there is a paying-bed section and already there are signs of a waiting-list. The fact is that the poor-law hospitals led the way in "payment," which was competent and could be exacted under the statute. One poor-law authority made an income of at least £10,000 a year from this source. With these forces working steadily in the non-pauper direction, the public hospital systems in Scotland will soon shake themselves clear of any "stigma" and the voluntary hospitals will be among the chief gainers.

THE HÆMOPOIETIC FACTOR IN MARMITE

WE publish this week a short report by Dr. Lucy Wills, who was granted leave of absence to work in Bombay this winter, on the results of her investigations. Her object was to analyse further the nature of the curative factor contained in marmite for tropical macrocytic anæmia. Although the problem is not solved, she has been able to push knowledge a good deal further. Her first observation that this disease is cured by the administration of marmite [1] led M. B. Strauss and W. B. Castle [2] to make a trial in pernicious anæmia of marmite, in combination with normal gastric juice which contains what these workers have called the intrinsic factor. The experiment was successful; the combination proved curative and the conclusion was reached that marmite contains the extrinsic factor, postulated by Strauss and Castle, who, on the basis of further experiments, suggested that this factor may be vitamin B_2, or some closely allied substance. It may be fairly safely assumed that the curative factor in marmite for tropical macrocytic anæmia, and the extrinsic factor of Strauss and Castle, are identical. By making a further study with tropical macrocytic anæmia, Dr. Wills has now sought to ascertain whether the curative action is really to be ascribed to vitamin B_2 or any other known element of the vitamin B complex; and one by one she has been able to eliminate these. With a number of special preparations from yeast, egg-white, and rice polishings, specially designed to provide the different vitamin fractions, no success was encountered, and it is interesting to note that the egg-white preparation, which provided vitamin B_2 in a concentrated form, also failed when administered in conjunction with normal gastric juice to a single case of true pernicious anæmia (see p. 1286). For the macrocytic anæmia, an extract of yeast, accepted as containing all the known fractions of vitamin B, was next tried, and it was found that though the commercial yeast extract (marmite) was successful, the other laboratory extract was not. The previous success with marmite was, it should be noted, emphatically confirmed. Lastly, whole yeast was tried and, most surprisingly, it too failed. Unfortunately the only whole yeast available was a distillery yeast from Amritsar; the raw material, brewer's yeast, from which marmite is made was not to hand. It cannot, therefore, be said that the curative factor is absent from whole yeast, appearing in marmite as the result of the commercial manufacturing process, but it looks very

[1] Brit. Med. Jour., 1931, i., 1059.
[2] THE LANCET, 1932, ii., 112.

much as if that might be so. Marmite is made from yeast by a process of autolysis which destroys most of the glycogen present and breaks down some of the protein into its simpler products. Dr. Wills suggests that one of these break-down products forms the hæmopoietic factor. She has shown it to be heat stable and soluble in water and 80 per cent. alcohol. That there are other hæmopoietic factors in marmite than vitamin B and iron is also suggested by L. G. Parsons and F. M. Hickman [3] as a result of experimental work on nutritional anæmia in rats.

It is unfortunate that the research on the nature of Castle's extrinsic factor is greatly hampered by being confined to the experimental treatment of very ill people, whether pernicious anæmia patients or persons suffering from tropical macrocytic anæmia. The great need is for an experimental animal, and a few preliminary investigations along this line by Dr. Wills [4] suggest that the monkey may be used for the purpose. Fed upon a diet, based upon one in common use among sufferers from the disease in Bombay, monkeys developed a macrocytic anæmia. If the diet can be standardised and the anæmia regularly produced, progress in knowledge should take the rapid course it usually follows when experiments with animals can be freely made.

RADIUM AND X RAYS IN CANADA

Two years ago the Legislative Assembly of Ontario appointed a Royal Commission to inquire into the use of radium and X rays in the treatment of the sick and to report on the advisability of securing a supply of radium for the province. Before reporting the commissioners visited radiological centres in Canada, the United States, Great Britain, France, Sweden, Germany, and Denmark. In their report [5] the commission describes the equipment and methods found at various centres visited, and quotes the personal opinion of many well-known experts. Sections deal with the prevalence of cancer, its ætiology, distribution, and character, and its treatment. The uses and limitations of radiotherapy are briefly summarised, and the conditions necessary for carrying out satisfactory radiotherapy in cancer are set out. On this subject, if on no other, experts all over the world seem to be in agreement, and their solution is summed up in the words: organised coöperation and expert radiotherapists. The results of treatment of cancer at the various centres are given briefly and clearly, and the fourth chapter is an account of cancer research in all parts of the world and the methods adopted to educate the public about cancer and to organise social services. In its conclusions the commission reviews what knowledge there is of the cancerous process, and stresses the delay in seeking advice and its deplorable results. It argues that the subject is a suitable one for governmental consideration and for the coöperation of all parties, since disease is one of the chief causes of poverty and cancer causes grave economic loss to any country. Therapeutically its conclusions are that radiological methods, quite apart from their palliative value, are actually more satisfactory than surgery for certain areas, such as the skin, lips, tongue, mouth, throat, and cervix uteri, although not for cancer as a whole. The radium bomb and high-voltage X rays are mentioned as deserving further investigation. The amount of radium required by any country is estimated as two grammes per million of population or per thousand deaths from cancer. The commission urges the government to establish radium therapeutic centres with adequate laboratory facilities in association with the large general hospitals, and recommends the appointment of a supervising commissioner. An active social service for follow-up work and the maintenance of close coöperation is regarded as essential. The commission recommends the government to purchase radium for the province and to encourage sympathetically all forms of cancer research.

[3] Arch. Dis. Child., 1933, viii., 95.

[4] Wills, L., and Bilimoria, H. S.: Ind. Jour. Med. Res., 1932, xx., 391.

[5] Toronto: H. H. Ball. Pp. 171.

ARABIAN MEDICINE

To the May number of the *Annals of Medical History* Dr. Lufti M. Sa'di contributes some reflections on Arabian medicine at Salerno and Montpellier, which are followed by an interesting article from Dr. Dana C. Munro and Dr. Cushman D. Haagensen upon the Usamah memoirs. The rise of Arabian medicine is critical in medical history. Greek, Roman, and Egyptian medicine had reached its zenith by the second century A.D., and the scientific spirit infused through the world from Greece had begun to decline. Then arrived Arabian science, and little progress whatever was made in Europe for 1000 years save that due to the influence of Arabia. Dr. Sa'di points out how, while Christian Europe was falling into the depths of ignorance, the Saracenic world, as represented by medicine in the cities of Bagdad, Cairo, Cordova, and Toledo, was progressing in culture. These cities were growing centres of intellectual activity and the Canon of Avicenna ranked with the Hippocratic Corpus in many minds. The stories of the medical schools of Salerno and Montpellier show the important rôle played by Arabian learning in maintaining the standards of medicine, such as they were, and preparing the way for the great mediæval revival. But Arabian science, as represented in the memoirs of Usamah, was a curious combination of learning and superstition. Usamah ibn-Munquidh was not a doctor; he was a warrior and hunter, a scholar and aristocrat. He lived for 93 years, that is from 1095–1188, and spent a large proportion of his time in the hunting field or in making war. His practical interest in medicine was pertinently brought about by the observation of his own wounds and their treatment. He concluded his diary with the words: "Destiny seems to have forgotten me, so that now I am like an exhausted camel left by the caravan in the desert." His modest prediction of oblivion has been falsified, for most writers on the Arabian culture of 1000 years ago have been inspired by his information and reflections.

A SIMPLE TREATMENT FOR SYCOSIS

THE lot of the chronic sycotic is not a happy one. Covered day and night by ointments or lotions, subjected to weekly injections of vaccines, stock or autogenous, blistered or exfoliated by the mercury-vapour lamp, epilated more or less successfully by X rays, and finally painted green or violet according to the artistic bent of his medical adviser—such are therapeutic phases through which many of the unfortunate sufferers have passed and have remained uncured. Dr. J. J. Ayit Scott describes [1] a form of treatment which by virtue of its simplicity and absolute harmlessness deserves a thorough trial. He speaks with the best of all authority, that of personal experience, for he was himself a victim to chronic

[1] Brit. Jour. Derm. and Syph., May, 1933, p. 190.

marginal blepharitis, which is often an association or complication of sycosis. This he cured with nightly applications of a 75 per cent. solution of ichthyol, after washing the lids with a weak solution of glycothymoline in warm water. His intranasal sycosis yielded to the same treatment, and he then proceeded to apply it to cases of chronic sycosis in the out-patient departments of the Birmingham, Midland and General Hospitals. Small pustules were pricked with a sterile needle, and the affected parts washed with a 10 per cent. ichthyol soap, after which the same solution was painted on. The paint, he says, dries on and does not come off on the bedlinen. Washing next morning removes all traces, and no further treatment is advocated in the daytime—another great advantage. If scaliness should ensue towards the end of the treatment, a little yellow oxide of mercury is permitted. Dr. Scott adds that the treatment must not be used for recent acute eczematised examples of the disease, which yield better to a 2 per cent. zinc sulphate solution in calamine lotion. The average duration of cure by his method would appear to be in the neighbourhood of two months; this is not too bad for a condition which, untreated, may last ten years or more.

ATEBRIN WITH PLASMOCHIN IN MALARIAL CONTROL

THE Rumanian Malaria Research Laboratory concerns itself with an area of some 25 square miles of the Rumanian plain, including 15 villages and about 10,000 inhabitants. In this area it has proved impracticable to get rid of mosquitoes; the gradients are too low for drainage, and the rivers too sluggish and weed-choked. The most hopeful policy therefore was deemed that of freeing the human carriers from their malaria. Carriers were sought on a uniform plan throughout the area. Visits were paid from house to house and blood examinations made, the deep drop and film of each person being examined by each of two expert observers for five minutes before being passed as negative. Of the 15 villages, 11 were left as controls, the others being dealt with in different ways, one with quinine, one with plasmochin, one with chinoplasmin, and the fourth, Suliman, with atebrin-plasmochin (atebrin to get rid of schizonts, plasmochin against gametes). From Suliman comes the report that has just appeared, by Drs. D. Mezincescu, F. M. Peter, and D. A. Cornelson.[1] Suliman is a village of 47 poor cottages with 250 inhabitants. In it 78 were found infected during examinations in August, 1930, and February, 1931. Spleen examinations were made at the same time and 67 found to be enlarged (they decreased as treatment went on). In August, 1931, plans having been completed, all carriers were given atebrin 0·2 g. daily for eight days, and plasmochin with it, either 0·02 g. simultaneously on each of the eight days (22 patients), or on the eight succeeding days (12 patients), or 0·04 g. on the eight succeeding days (39 patients); children were given smaller doses of atebrin. Relapses were said to be fewer when both drugs were given together, but the numbers for comparison are small. Blood examinations were made again on the day before treatment, on the fourth atebrin day, on the first plasmochin day, and on the day after treatment ended. Five control examinations were made later, in September, October, and November, 1931, and in March and May, 1932, that is, 11 in all for each carrier, so that hardly one relapse can have been missed; 11 relapses were recorded, all in children. It is probable that the doses given to the children were too small. They are apt to be heavily infected, and since atebrin attacks the plasmodia directly, not indirectly by causing antibody formation, relatively large doses are required. Eighteen new infections were observed; four of them related to the refusal of a mother to have her baby treated in this new way till a fortnight had been spent in persuading her, local mosquitoes becoming meanwhile infected. As to results as a whole, the parasite index in Suliman, which was 33·2 per cent. before the experiment was begun, fell to 13·2 per cent. in a single year, and there can be little doubt that results will be still better when the system has been longer established. It is particularly important that every child, however young, should be examined, since children are liable to very heavy infection; and that every case of relapse or new case from outside should be treated at once to prevent the spread of infection. The results for Suliman for the year (1932–33) are to be given in another paper, and we are promised a report on the other villages of the district which will be awaited with interest.

[1] Arch. f. Schiffs- u. Tropen-Hygiene, May, 1933, p. 223.

GETTING BACK TO WORK AFTER ILLNESS

THE almoner, in a sense which falls outside the experience of any other hospital officer, sees the patient as a whole. A paragraph from the annual report on the work of the social service department of St. Thomas's Hospital is worth quoting:

> "She sees the patient who has never been up to the hospital before, who is frightened of the unknown, bewildered by the procedure and by the sights and sounds of hospital, and possibly haunted by the dread of serious illness, a dread which may or may not be well founded. While the almoner may often be called upon to help a patient to bear what is really serious and to adjust life to powers which are necessarily growing weaker, her task is often to drive home the words of the doctor that there is nothing seriously wrong and to help to lift the weight of apprehensive fear which in itself may be as crippling as the reality of disease."

In addition to the other duties the almoner also runs an unofficial employment bureau and tries to find suitable work for those whose physical condition calls for employment of a special kind. In existing circumstances this is becoming increasingly difficult, for as the report points out the comfortable theory that it is only the idler or the reckless who need remain out of work is no longer tenable by anyone who is in touch with the labour market. The almoners, however, have their successes, even in these dark times. An outstanding example, quoted in the report, is that of a boy of 15, under observation as a tuberculosis contact, who had acquired a taste for country life when sent away for a holiday by the Winter Distress League; later, a post as gardener's boy was found for him on a large estate in Surrey. In the Lydia out-patient department, which deals with venereal diseases, a special effort is made on behalf of unmarried girls who have become infected. A number of these are admitted to a hostel, for care and treatment, and efforts are made to build up their confidence and courage afresh. A few pregnant girls can be taken, and these are admitted to hospital for their confinement, returning to the hostel afterwards. Situations are found for girls leaving the hostel, usually in domestic service. Where there is a baby to be considered it is often possible to find a sympathetic mistress who will accept both mother and child, or, if the girl is unequal to the dual task of doing her work and looking after the baby, a foster-mother is found. Rather a special problem is presented by patients from the department of psychological medicine,

for it is scarcely possible to find posts for them in the labour market when so many normal people are unemployed. The almoners have tried the experiment of finding unpaid occupation for those patients who already have some means of support, and, when the patient can be induced to take the plunge, this has often proved most successful. This applies mostly to patients who have had clerical experience or training ; for those who have always been engaged in manual labour the solution is not easily found. The report suggests that some form of occupational therapy for out-patients attending the department would be valuable. In orthopædic work, attention is drawn to the need for a home for adolescent boys and men where skilled trades and handcrafts could be taught. This would undoubtedly ease the difficulty of finding employment for crippled patients who had spent long years of idleness in hospital.

FURTHER CONTROL OVER NARCOTIC DRUGS

THE Home Secretary announces that the Dangerous Drugs Act, 1932, which was passed to give effect to the International Convention for limiting the manufacture and regulating the distribution of narcotic drugs of 1931, will come into operation on July 9th, the date on which the Convention comes into force. The chief alterations made by the new Act will be the extension of control to the following drugs :

The esters of ecgonine and their respective salts.
The esters of dihydrohydroxycodeinone, dihydrocodeinone, dihydromorphinone, acetyldihydrocodeinone and their respective salts.
Dihydromorphine, its salts, its esters, and salts of its esters.
Morphine-N-oxide (genomorphine), the morphine-N-oxide derivatives and any other pentavalent nitrogen morphine derivatives. Thebaine and its salts.
Benzylmorphine and the other ethers of morphine and their respective salts.
Any preparation, admixture, extract, or other substance containing any proportion of any of the above substances with the exception of the esters of ecgonine and their respective salts.

After July 9th the Dangerous Drugs (Consolidation) Regulations, 1928, will apply to these drugs and the licence or authority of the Secretary of State will be required to import, export, manufacture, supply, procure, or possess them. The Act also makes it an offence for any person in the United Kingdom to trade in, or manufacture for the purpose of trade, any products obtained from any of the phenanthrene alkaloids of opium or from the ecgonine alkaloids of the coca leaf not being a product which was on July 13th, 1931, being used for medical or scientific purposes. The Act permits of the application by Order in Council of Part III. of the Dangerous Drugs Act, 1920, with modifications to methylmorphine (codeine), ethylmorphine (dionin), and their respective salts, in order to comply with the requirements of the Convention of 1931, which will apply control to the wholesale trade in these drugs. It is contemplated that the requisite Order in Council will be made later in the year.

ANÆSTHESIA IN OPERATIONS ON THE UPPER RESPIRATORY TRACT

A LARGE number, perhaps the majority, of patients, faced with the prospect of an operation, dread the anæsthetic more than the operation itself ; and it is noteworthy that this dread is by no means diminished by the fact that the patient has had previous experience of anæsthesia. This dread of the anæsthetic assumes a relatively greater proportion when the operation itself is not a severe or dangerous one, as most surgical procedures on the nose and throat. The actual discomfort can, of course, be greatly diminished by skilful induction but, even under the best conditions, what the patient most dislikes is the surrender of the conscious self into the hands of another. The more closely this surrender can be made to resemble natural sleep, the more readily will he submit without emotional disturbance. Nowadays in most operations this indication can best be met by the use of a pre-anæsthetic or basal narcotic ; but, for operations on the upper air-passages, it is essential that the cough reflex be present during recovery, and indeed quite soon after the operation has been completed, in order to avoid the danger of the entrance of blood and septic material into the bronchi. Avertin, administered by the rectum, fulfils this requirement well. Its use in operations on the upper respiratory tract is advocated by Sir Francis Shipway and by Mr. E. G. Collins of Inverness in the current number of the *Journal of Laryngology and Otology*. It should be given in doses of 0·1 g. per kilogramme of body-weight, the dosage being reduced for debilitated or elderly patients, and increased to 0·12 g. in very muscular, alcoholic, or highly nervous subjects. In this dosage avertin acts as a basal narcotic rather than as a complete anæsthetic, and it is usual to supplement its action by the administration of ether, or of gas-and-oxygen ; local anæsthesia may also be employed, and this has been the routine in Mr. Collins's practice, where it was supplemented by ether in only 15 out of 54 operations. It is important to note that the effect on the cough reflex is insignificant, and in some cases even absent. It is this feature that renders avertin particularly suitable for pre-medication in operations on the nose and throat

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THE announcement of the death of Lord Cobham on June 10th, after an operation in St. Thomas's Hospital, will remind the medical profession that Dr. Gervase Disney Alexander succeeded to the Barony of Cobham in 1916. His father, who was consulting physician to the Royal Infirmaries of Bradford and Halifax, submitted in 1909, in company with others, a petition for the termination of the abeyance of the Baronies of Burgh, Cobham, and Strabolgi. These claims were heard by the Committee for Privileges in 1911, when each petitioner seemed to have equal cláims to them. In 1916 the Barony of Strabolgi was restored to its present holder, who bore the name of Cuthbert Mathias Kenworthy ; but Dr. R. G. Alexander died before the Crown had taken action about the Barony of Cobham. It was only after an attainder had been removed by Act of Parliament shortly after his death that his son was summoned to the House of Lords as the twelfth Baron Cobham. Dr. Gervase Alexander was educated at Cambridge and St. Thomas's Hospital ; he qualified in 1906 after which he filled clinical assistantships at a number of children's hospitals in London. He was unmarried.

THE second congress of the International Society of Orthopædic Surgery will be held at the house of the Royal Society of Medicine, 1, Wimpole-street, London, W., from July 19th to 22nd, under the presidency of Prof. G. Nové-Josserand, of Lyons.

THE centenary celebrations of the medical school of the University of Bristol will be held on June 30th and July 1st, when the Chancellor, Mr. Winston Churchill, will confer honorary degrees on the presidents of the Royal College of Physicians of London, the Royal College of Surgeons of England, and the General Medical Council, and on Sir Frank Colyer, Prof. Hey Groves, and Prof. Miles Phillips.

SPECIAL ARTICLES

EXPERIMENTAL PRODUCTION OF MALIGNANT TUMOURS[1]

BY J. A. MURRAY, M.D., F.R.S.
DIRECTOR OF THE IMPERIAL CANCER RESEARCH FUND

THE investigations of the last 30 years have proved that the cells of the higher vertebrates, under appropriate conditions, are capable of unlimited proliferation, and it is of importance in discussing the problems of experimental carcinogenesis to remember this fact, and to have clear ideas of the characteristic features of the proliferation of new growths, including cancer. This is very necessary because nothing is commoner in the literature of the subject than loose statements that this or that agent confers on the cells powers of unlimited proliferation, which is nonsense, seeing they already possess these powers. The essential feature is the uncontrolled or autonomous character of the cellular proliferation, that is to say, the agencies which are effective in the body in limiting the rate and amount of growth and cell division are ineffective against true new growths. This is true of both classes of new growths, the benign as well as the malignant. Examples are seen in the fatty tumours, lipomata which go on increasing in size in an emaciated individual, and the uterine myomata which grow progressively even after the menopause while the ordinary uterine muscle is shrinking or quiescent. The malignant new growths, carcinoma and sarcoma, exhibit this feature still more clearly because many show a more rapid rate of growth. The other distinctive features of the malignant as contrasted with the benign new growths are differences in degree, rather than in kind, and their more perfect independence or autonomy manifests itself in infiltrative progress, disorganising and destroying the normal tissues encountered, by pressure from without, or occlusion and rupture of blood-supply. The stretching and tearing of the walls of blood and lymph vessels opens the way for the entrance of smaller or larger aggregates of the parenchyma cells into the vessels, and these transferred to remote situations further exhibit their independence and adaptability to new surroundings by the formation of secondary centres of growth or metastases. It is these manifestations of neoplasia which render cancer so formidable a problem in treatment.

These new proliferative conditions arise in limited localised foci, and once they have reached a size sufficient for recognition further increase takes place only from the descendants of the already transformed cells without fresh accessions from the surrounding elements of the same kind. The original focus may be solitary, or several foci (all minute) may appear almost simultaneously, and soon fuse into one tumour. One type of cell only acquires these new properties and by its multiplication gives rise to the new formation, so that it is usually possible by microscopic examination to infer the tissue of origin, even after the tumour has reached a great size. The growths of any one tissue do not reproduce the full characters of the differentiated tissue of origin to the same extent. They form a continuous series ranging from apparently perfect reproduction of the histology of the parent tissue to a condition in which no specific differentiation can be recognised at all. Much unnecessary ink has been spilt in devising suitable words to describe this "undifferentiated," "dedifferentiated," "anaplastic," or "embryonic" state, but what is worth emphasising is the fact that the degree to which it occurs is relatively fixed in any one new growth, and is maintained practically unaltered throughout its course. The rate of growth shows a similar uncorrelated series of gradations, and there is much evidence to show that this also is (or at least may be) an initial, inherent quality of the essential constituent parenchyma cells.

Many of the ideas and conclusions in the preceding summary have obtained a welcome precision and validity from the study of the transplantable malignant new growths of the mouse and rat during the past 30 years. In consequence we may now, with some confidence, define the new growths as single tissue proliferations arising in a localised area, growing their own resources in an uncontrolled manner, showing a continuous graduated series in those arising from any one tissue, both in histological structure and in rate and habit of growth. In spite of this great range any one variety is relatively permanent. Descriptive convenience has determined the order in which these characters are enumerated as I find it impossible to give them marks indicating relative importance. We are still without a satisfactory explanation of the process which embraces all these characters, and it is hazardous (to me impossible) to accept any hypothesis of the nature and origin of new growths which omits any one of them from its ambit.

The necessity, here indicated, of keeping in mind several nearly independent biological processes is common to many pathological problems. It prevents that artificial simplification of the material which has been so powerful an instrument in the advancement of the physical sciences, and to a considerable extent of physiology.

Attempted Solutions of the Cancer Problem

The attempted solutions of the problem of the nature and causation of malignant new growths, carcinogenesis, which it will be profitable to discuss at this meeting fall into three groups:—

(1) The genetical hypothesis originating with Boveri, and modified by Bauer.

(2) The virus hypothesis particularly associated with the names of Borrel, Rous, and Gye.

(3) The special form of the chronic irritation theory of Virchow which has arisen on the basis of the work of Yamagiwa on the experimental production of tar cancer.

THE GENETICAL HYPOTHESIS

Boveri's hypothesis was an outcome of his well-known studies on the development of dispermfertilised echinoderm eggs. Boveri had shown that the haploid number of chromosomes or any multiple of it was compatible with normal development. He ascribed the pathological development of these disperm eggs to chromosome defect, one or more of the four primary blastomeres having received an incomplete set of chromosomes from the multipolar first segmentation division. Direct observation on cancer cells showed that a constant abnormal chromosome number was not found in any one new growth, and the hypothesis was accordingly modified by assuming an invisible, partial damage to individual chromosomes. The necessity of assuming a haphazard

[1] The opening address at a discussion meeting held under the auspices of the Royal Society on June 15th.

origin from multipolar mitosis retreated into the background, Boveri's own attempts to initiate malignant new growths by this means having failed. It was an easy step to shift this assumed damage to the genes, the invisible chromosome constituents bearing the hereditary factors. This assumption made the hypothesis practically invulnerable by withdrawing it from the possibility of experimental proof or disproof. The main objection to it now is the necessity involved of assuming a large number of constituent units in each gene to allow for the great number of slight modifications presented by the new growths of any one tissue, all practically permanent.

THE VIRUS HYPOTHESIS

The modern discussion of this hypothesis revolves around the study of the filtrable tumours of the domestic fowl first discovered by Rous. Rous himself described four strains of sarcomata, all transmissible by cell-free filtrates, and many pathologically distinct. Subsequent workers, according to a recent review by Murphy, have brought the number up to 30. Their most remarkable feature is the biological and histological constancy of the growths propagated by cell-free filtrates and the multiplication of the active constituent of the filtrates, during growth in the susceptible animal. While the latter character points to a living, self-reproducing agent or virus, the variety of stable strains, each requiring a slightly different virus, has proved too much for many workers and an enzyme-like derivative of the cell protoplasm has been imagined to surmount this fence. Gye's genial conception of a factor derived from the host cells and carrying all the specific distinctive characters of the tumour strain, acting in conjunction with a relatively non-specific virus, is still without direct experimental proof. Like the enzyme modification the greatest obstacle to its acceptance is the failure to demonstrate cell-free transmission in the laboratory strains of mouse and rat tumours. Till this is accomplished it is dangerous to transfer conceptions arising out of the study of the filtrable new growths of the fowl to the elucidation of the nature and causation of the new growths of other animals and man. On the other hand, the similarity in behaviour of the filtrable tumours to the new growths of mammals imposes the necessity of investigating them, till the nature of the agent is elucidated and its mode of action, so different from that of the majority of viruses, is explained.

THE CHRONIC IRRITATION THEORY

The experimental confirmation of Virchow's chronic irritation theory in the last 20 years has established its validity as a concise description of the emergence of cancer after prolonged, localised, slight irritation of the tissues by a variety of agents and nothing more. Wide differences of opinion still find expression as to how this result is brought about. As an important section of the present discussion will bear on the various aspects of this problem it may be of service to those without personal experience of the process to describe the course of a typical experiment of tar cancer induction in mice. If 100 mice be painted twice weekly on a small area of the back the following series of changes are observed. In the first two or three weeks the hair hypertrophies and becomes thicker and longer on the painted area. The hypertrophied hairs then fall out and are not replaced and the tarred area becomes hairless and remains so. If the skin at this stage be examined microscopically the covering epithelium is found to be thickened, the subepithelial tissues show a variable amount of increased cellularity and infiltration with lymphocytes, mast cells, and a few polymorph leucocytes. In the deeper layers, sometimes even below the panniculus carnosus, the tips of hypertrophied hair follicles are found, but these ultimately disappear as painting is continued. After 12 to 16 weeks localised thickenings of the squamous epithelium appear as discrete warty prominences in the otherwise smooth skin surface. One or more of these increase in size and project above the surface as warty outgrowths. Microscopically they have the structure of benign papillomata, and if painting is now stopped they may either (1) disappear completely, (2) remain as warty papillomata for a long time, slowly increasing in size, or (3) after a variable length of time, begin to grow more rapidly, becoming adherent to the surrounding skin and deeper tissues. Their further progress is continuous and the growths manifest all the features of cancer both to the naked eye and microscopically. The death of the mouse follows in six to eight weeks and after death metastases may be found in the nearest lymph nodes and in the lungs, occasionally in other internal organs. In a certain number of animals the proliferative condition is malignant from its first appearance, without the apparently benign intermediate stage. We have not yet any method of distinguishing the papillomata which will remain quiescent from those destined to undergo the further progressive malignant development, and in consequence during the remainder of the time of observation more and more of the apparently benign warts pass into the third (malignant) group till after 12 to 15 months all the mice have developed tar cancers with the exception of a few which still bear simple warty papillomata and one or two in which no proliferative changes have occurred at all. The same succession of changes follows the intermittent long-continued application of a number of different chemical substances, some related to coal-tar, others not. The processes involved are apparently the same as those responsible for the development of several forms of industrial cancer, and the experimental work has provided a secure basis for the incrimination of tar, shale oil, soot, and arsenic in the causation of the corresponding industrial cancer. In addition, other chemical substances exuded by animal parasites, and physical agencies such as cold, ultra-violet light, X rays, and radium radiation can replace coal-tar. The preliminary silent period and successively appearing growths as the applications are continued are exhibited by the intentional and unintentional experiments alike. They furnish a simple, natural explanation of the age-incidence of cancer, a feature which formerly seemed mysterious.

While the constancy of the results of such experiments and the frequency and restriction of certain cancers to those following definite occupations involving exposure to the same substances fully justify the naming of them as *carcinogenic*, it does not take much reflection to see that the essential nature of cancer and the cellular changes involved remain unexplained. Although the agents are applied uniformly over a considerable area, the cancerous process appears only in localised foci and not diffusely. Even in those cases in which a diffuse origin throughout a whole organ is encountered it is almost certainly due to close juxtaposition of many minute foci and not to a spreading involvement of adjacent unaffected cells.

The chemical and physical carcinogenic agents, in my opinion, act indirectly; they set up conditions

in the tissues such that, as a new departure, here and there cancerous foci are started. The chemical properties of these agents give no indication of how the autonomous, uncontrolled type of proliferation is induced, indeed they are so varied that it is difficult to see how they can give any definite indication of the nature of the cellular mechanism involved. Until this difficulty is at least partially obviated it seems unnecessary to indulge in the further speculation that the less precisely known carcinogenic agents, secretions of animal parasites, application of cold, X rays, &c., produce this effect by liberating in the tissues substances, more or less closely related chemically, to one or other of the pure substances with carcinogenic action.

Conclusion

From this brief summary it is clear that the experimental induction of malignant growth reproduces perfectly the phenomena which occur in the development of occupational cancer from exposure to tar or X rays, for example. The other forms of cancer for which no definite irritant can be identified at present are so similar in their mode of occurrence and the length of time necessary for their appearance that it is reasonable to accept the facts of experimental carcinogenesis as a model of the genesis of the others also. An attempt has been made to indicate directions in which difficulties still remain. The definition of these difficulties, and the material and methods by which they are being attacked, we owe to the modern development of experimental carcinogenesis.

ROYAL INSTITUTE OF PUBLIC HEALTH

THE annual congress, held at Eastbourne from May 30th-June 4th, was as usual divided into a number of sections meeting concurrently. At the opening Lord LEVERHULME gave the presidential address which has already received notice (June 3rd, p. 1192). In the section of State medicine a special address on the economic test of the limits of

Public Health Expenditure

was communicated by Sir JOSIAH STAMP. In it he pointed out that it was often impossible to assess exactly in money the gains from some proposed advance in public health, and it might even be difficult to isolate the cost of the proposal so that it was only rarely that one could be set against the other. Questions of degree entered in at every stage. An elaborate drainage system might be a good bargain over nearly all the area, but too costly a boon for remote or outlying districts.

Sir Josiah distinguished three classes of expenditure: remedial, preventive, and progressive. Then it might be asked about any object of expenditure whether it yields a money advantage, such as an increase in the direct earning capacity of an individual or a community. Public improvement of drainage or water-supply or the amenities of a spa would be economic. Facilities for the rapid convalescence of adult workers might be strictly economic, whereas for their children it might not be directly so. Some expenditure yielded a clear profit; in other cases the gain might be approximately equal to the expenditure, while in a third group it might be less than the expenditure, though here the non-economic gains were expected to come in to balance. A subdivision of the economic class could be made as (*a*) profit-making expenditure, (*b*) self-liquidating expenditure, (*c*) losing but worth-while expenditure, (*d*) unprofitable. The next consideration was whether the expenditure was outright or must be continuous to secure its advantages; and the harm done by failure to spend might also be outright, continuous, or progressive. All these questions were subconsciously asked and answered when any expenditure was proposed. Why not drag then a little more consciously to the surface?

PUBLIC ASSISTANCE HOSPITALS

Dr. E. BRUCE LOW (Med. Supt., Southlands Hospital, Shoreham-by-Sea) submitted a paper dealing with the extended use of small county poor-law institutions; these, he said, were merely infirmaries and did not cater for the acutely sick. Many public assistance authorities realising that a judicious use of their institutions will, in these days of financial distress, provide a sufficiently satisfactory public medical service for the time being have hesitated to launch forth into the possibly involved and difficult procedure of declaration and appropriation; they have preferred to separate the infirmary from the institution and to expand the scope of their infirmaries and seek for them the altered title of public assistance hospitals. Although from the medical standpoint such partial separation is not so satisfactory as the establishment of an independent hospital, the move is more controlled; progress can be accelerated according to the calls made on the medical service and the financial position of the authority. An important section which can be developed in the public assistance hospitals is the reception and treatment of the non-notifiable infectious diseases—measles, whooping-cough, mumps, pemphigus neonatorum, and infective enteritis—especially where they are complicated. In rural districts it is also difficult to find accommodation for such cases as impetigo, ringworm, venereal disease, erysipelas, and ophthalmia neonatorum anywhere else than in the public assistance hospital. The possibility of admission of cases of sudden or urgent necessity to such a hospital by the medical superintendent does away with the cumbersome and dangerous mechanism of having to send relatives to search for the relieving officer. It is no longer accepted that the State should assist a sick person only when he is a menace to the health of others, or is entirely destitute.

CONGENITAL SYPHILIS

In the same section Dr. DAVID LEES (Edinburgh) reminded his audience that inherited syphilis was a direct result of untreated maternal syphilis. The percentage of infected mothers varied from 3 to 10. Clinical evidence of syphilis was present at times in primigravidæ, but rarely in multigravidæ. Statistical evidence of untreated disease in the mother showed its serious effects in the offspring: in a series of over 1000 such pregnancies there was an immediate death-rate of 28·4 per cent. of the children, and death before 5 years of age in 36·2 per cent., while 24·5 per cent. only of the children were healthy and survived. A similar survey of efficiently treated cases showed 89·2 per cent. of healthy children, and an even larger percentage if the treatment of the mother was commenced before the sixth month of pregnancy. These results, obtained in Edinburgh, were in agreement with those in other large centres. Some of the cases of inherited syphilis he had seen could only be diagnosed by serological tests. Mothers and children should not be treated at a V.D. clinic. Antisyphilitic treatment had been carried out with

success at maternity and child welfare centres in Glasgow and Edinburgh.

Tuberculosis

In the section of tuberculosis Dr. VERONICA DAWKINS (late R.M.O., Maltings Green Sanatorium) gave her impressions of the tuberculosis problem in Germany. Owing to the financial crisis, the well-planned schemes of the Landesverband, which deals with non-insured patients, have had, she said, to be curtailed, and the Landesversicherungsanstalt, which deals with insured workers, has been obliged to tighten up its regulations more and more. The Reich scheme formed in 1929 included the observation of adolescent contacts with X ray examinations two or three times a year up to the age of 30, but this has been abandoned. In December, 1931, instructions to secure economy were issued by the Ministry; they, however, insisted that there must be no cutting down in expenditure for the isolation of an infectious patient in his own home, such as by providing a bed or room for himself, assistance with rent, &c. Stricter selection of the sanatorium cases was to be made. Under-nourishment constitutes a serious problem; Germany now has at least 15 of its 64½ million people living on the dole or in receipt of public relief. The allowances for the unemployed, already small, were reduced in August, 1932; whereas in 1930 the man with three dependants received from 20–28 marks a week, he now gets from 13–20 marks. The food-purchasing value of the mark is now estimated authoritatively to be equal to that of the shilling at par. The deduction that the unemployed German now receives only one-third to one-half the allowance paid to the Englishman is, however, not justifiable. German rents are less, cheap meals and charitable aid are available from time to time. Prices of foodstuffs in the several parts of Germany also vary. At the Tuberculosis Hospital at Heidelberg, Dr. Dawkins saw a number of young mothers suffering from starvation and tuberculosis; they tend to deny themselves food and give it to the children, and to go out to work in the cigar factories. Most astonishingly however, the vital statistics of Germany show a steady decline in the death-rate from all causes up to the end of 1930. The curve showing death-rate from tuberculosis, considerably higher than the English one before the war, in 1926 drew level, and in 1928 actually crossed it (9·1 for England and Wales and 8·8 for Germany). In Germany, as in England, the mortality is greater in the age-group 15–30; it is greatest in the subgroup 20–30. Female mortality exceeds male; the rate in females, especially in Baden, has declined to a much less extent than in males. The Baden conclusions are that the unsuitability of adolescent girls for factory work and the double strain of motherhood and factory work are responsible; also the woman may have failed to maintain her insurance contribution and thus is not helped, as is the insured male, to institutional treatment. The steady decline of tuberculosis mortality through these difficult years is attributed to the extensive insurance system which includes the family of the workmen and benefits three-fifths of the German population. Dr. Dawkins said that it is, however, the general impression that the health of Germany is slowly deteriorating.

WORKSHOP SCHEME

Dr. W. C. STOTT (M.O.H., Cleethorpes, U.D.C.) described the tuberculosis workshop scheme opened in June, 1931, at Cleethorpes. At the end of the year's working, six males and two females were undergoing training. At first no payment was made but at the end of four months each patient was given 5*s*. a week. The year's sales amounted to £157, the patients received £35 in pay and there was a profit of £26. It was then decided to train all the male patients in carpentry, and specialise in portable buildings, such as garden sheds and poultry houses. Everything is sold at the market price; they have a stand at the local cattle market. The profits are increasing. In the course of the discussion, Sir PENDRILL VARRIER-JONES (Papworth) expressed the opinion that such schemes should provide centres for permanent employment of workmen. Dr. JAMES WATTS (Godalming) was not certain that permanent retention was necessary; some of the men, he thought, were eventually able to compete in the labour market. Dr. PETER EDWARDS (Cheshire) thought it possible to get about 5 per cent. of the patients to forget that they had ever been tuberculous. Men who had had a positive sputum once in the army and never again could find a job outside tuberculosis workshops. Dr. JANE WALKER (London) mentioned her favourable experience of the training of ex-patients in sanatorium nursing for a living. These patients, when sound again, should go on elsewhere, but she had, however, found them very unwilling to leave. Dr. STOTT, replying, stated that the National Health Insurance societies have no objection to paying sickness benefits to patients as long as they were not earning more than 5*s*. a week in such workshops.

Blood Transfusion

In the fourth section Mr. GEOFFREY KEYNES, opening a discussion on the organisation of a public transfusion service, said that it was the discovery that sodium citrate could be used as an anticoagulant and was non-toxic that led to the adoption of transfusion as a common therapeutic measure. Twenty years after its introduction the use of citrated blood is still the method of choice. Although the citrate is blamed for the rigors after transfusion, it is admitted that some patients have this reaction whatever method of transfusion be used. Post-transfusion rigors may be minimised by not allowing the blood to fall far below the body temperature, and by injecting it slowly; it should take half an hour to give 600 c.cm. The blood-group of every donor must be determined not only once but periodically every year or two, to make certain that it does not alter. The direct test between the donor's blood and the patient's serum should be made whenever this is possible. Universal donors (Group IV. of Moss's notation) should not be called upon indiscriminately for patients of all groups, or the supply of such donors will be exhausted and the transfusion service will collapse. Except in great urgency hospitals or individuals using the service should group the blood of the patient before asking for a donor. The technique of using corpse blood had been evolved in Soviet Russia; half a litre could be obtained from a body that had suffered violent injury. One and a half to two and a half litres could be drawn off from an uninjured corpse, from the internal jugular vein, up to ten hours after death, although it was said to be better to remove it within three hours if possible. The blood was citrated and preserved in the ice-chest; it has been used with good effect 16 days after withdrawal, but preferably should not be kept more than ten days.

Dr. H. F. BREWER (M.O., London Blood Transfusion Service) had found both males and females between 18 and 65 to be acceptable as donors. Any old tuberculous affection, he said, contra-indicates accept-

ance, and therefore a physical examination and, in certain cases, a skiagram of the lungs is necessary. The hæmoglobin in the case of a city dweller should not be below 94 per cent. A blood Wassermann reaction should be a routine, and malaria must be excluded. Subjects of a protein-sensitive condition, such as asthma, urticaria, and hay-fever, are not suitable. Of the last 600 new donors admitted to the London Service, 13 per cent. had excellent, 73 per cent. good, and 14 per cent. moderate elbow veins for the purpose. Donation of blood by menstruating women is not injurious provided the period is normal. It has been necessary to refuse less than 3 per cent. of prospective London donors owing to positive Wassermann reaction (0·3 per cent.), inadequate veins (0·5 per cent.), anæmia, history of tuberculosis, and so forth.

In this country and America, said Dr. Brewer, the Moss classification of blood-grouping is in general use, on the continent the Jansky classification. A third classification, the international nomenclature, should really be used. A Group IV. (Moss's classification) may have α and β agglutinants present in high concentration; if the α agglutinant is alone and very high, the more usual finding, such a Group IV. donor may cause a reaction when used for a Group I. or II. patient (not with a Group III.). Such a reaction may, although there is no actual evidence of hæmolysis, be so serious in a critically ill patient as to turn the balance against recovery. Dr. Paul Joure had told Dr. Brewer of a professional donor in Paris who had served 459 times, his minimum donations being 250 c.cm. He had donated 125 litres in all, and was in very good health. The minimum safe interval between donations of an average quantity of blood (400–700 c.cm.) appears to be three months for men and four months for women. The donors should not attempt to resume the upright position for at least an hour after service. Any lag in the re-establishment of the hæmoglobin figure, which usually takes 7–14 days, is best treated by the administration of iron—e.g., Blaud's pills and the addition of liver and kidney occasionally to the diet. Such treatment is rarely required.

Dr. A. B. PORTEOUS said that at St. Mary's Hospital they believed in using defibrinated blood. The service was made up of students and laboratory assistants, with a few regulars from outside. The donors were paid £5 for each private case; a medical student nowadays, instead of pawning his microscope came to see if there was any chance of a transfusion. It was important to keep the name of the patient from the donor; isolated instances had occurred of donors subsequently bothering patients for money.

Mr. P. L. OLIVER (hon. sec., Red Cross Transfusion Service) said it was six times as difficult to retain donors as to secure them. In London about 400 members are newly enrolled every year and 250 are lost, 80 per cent. of the loss being due to pressure by relatives, future relatives, colleagues, employers. The press in extolling the donor as a hero did the service much harm. The surgeon doing the transfusion should be skilled; probing for a vein did not stimulate the zeal of donors. Iodine burns had caused trouble. The expense involved had worked out at 6*s*. 11*d*. per case; this included keeping an office open day and night. To anyone starting a new service he strongly advocated the making of a charge. The services given by donors should be mentioned in the annual reports of hospitals.

Councillor F. W. MILLS (chairman, Voluntary Blood Donors' Association) thought it imperative not to overdo gratitude to the donor or to spoil him. He had served for transfusion in his lunch hour, gone back to work (as bank manager), and to a dance in the evening. Donors were almost always hypersensitive; they complained of lack of courtesy rather than lack of skill. Hospital staffs did not appreciate that the service was voluntary; he, and others, had frequently been asked "What do you do for a living besides transfusion?"

A CONFERENCE ON HOSPITALS

ON June 8th–10th a joint conference of the British Hospitals Association (B.H.A.) and the Incorporated Association of Hospital Officers was held in the Guildhall, Bath, when a discussion on

Pay Beds

was opened by Mr. G. T. WHITELEY (King's College Hospital) who based his remarks largely on a study of the report of the 1926 committee. Before starting pay beds, hospitals must, he said, consider whether they had the power, whether the hospital was properly situated for this kind of work, and whether the patients admitted into the ordinary wards, owing to the difficult times of the last few years, were entitled to be there or not. There was hardly a class, he thought, except perhaps the very rich, who had not some claim on hospitals. More and more people required hospital treatment. The most perfect system was a separate block for pay beds, but that meant great expense. The basis of any scale of charges was what it cost to maintain a patient. Most people preferred an inclusive charge; they disliked extras. Medical fees were usually settled between patient and doctor; in some cases through the intermediary of the secretary of the hospital. The objection to limiting attendance on paying patients to the hospital staff was that it was an unfair advantage; but it should be remembered that surgeons and physicians gave a great deal of their time to the hospitals without any return. The question of responsibility was not an easy one to solve. If anything went wrong at an operation the hospital might be held liable; and the hospital was bound to see that the surgeons were first class. In the smaller general and cottage hospitals local practitioners were allowed to attend and treat their patients. With a larger number of pay beds in a separate block, he thought the time would come when the practitioner would attend his patients also in the larger hospitals. Exception had been taken to the so-called well-to-do occupying pay beds. To this he would reply: they could not get the same treatment outside, and they helped to pay for the non-pay beds. He saw in the extension of pay beds the salvation of hospitals from difficult times and from a constant appeal for money.

Mr. STAMFORD HUTTON (Gloucester Royal Infirmary) spoke from the standpoint of a county hospital which had to cater for the needs of patients from the county town and other smaller towns and villages adjacent, and also from a large but sparsely populated area around it. Sometimes a county had two or more efficient hospitals supplying its needs—e.g., Gloucester and Cheltenham, only eight miles apart. It was only at one or other of these that the varieties of modern specialist treatment were obtainable. The essential, but very expensive, requirements of up-to-date surgery and medicine could not as a rule be duplicated in the area served. Two years ago the Gloucester Infirmary embarked on a large extension, including a floor for paying wards and the necessary accessories,

as there were grave objections to having paying beds in the ordinary wards. Some of the initial questions they had to consider may be of help to other hospitals embarking on similar enterprises. (1) Was anyone to be eligible for treatment whatever their income? It was decided that unless entry was limited to persons of moderate means injustice would be done to medical men whose patients could afford to be treated by them in nursing-homes. The limit was fixed at an income of £400 for a bachelor or widower without dependent children, £500 in other cases. (2) Were doctors other than those on the staff of the hospital to be allowed to attend patients sent in by them? The governors decided they could not take the responsibility of allowing anyone outside to treat a patient in the wards. (3) What should be the scale of charges? The governors feeling it incumbent on them to ensure that the paying wards were not a charge upon revenue, but should contribute something to the upkeep of the hospital, fixed the fees as follows: Maintenance, 3 guineas a week; medical fees, a basic fee of 1 guinea, with a further fee for each operation (according to its nature) of from 2 to 14 guineas; or, where no operation was needed, a further fee of 2 guineas for the first, and 1 guinea for each subsequent week. Where a second member of the visiting staff was called in, a further fee of 1 guinea. Further fees for radiological, dental, or pathological work. The only extras, special nurses or attendance, and extra diets. A careful costing account of the first six months showed that the pay wards had just paid their way. (4) How many beds altogether and how many in each ward? There were 200 beds in the ordinary wards of the hospital and they decided to provide 16 paying beds, four beds in one ward for men and women respectively, and four wards of two beds each to be used for either sex according to demand. (5) Provision was made for cases of serious accident or urgency (mostly motor accidents), admitted to the general wards before particulars of income were known, by ordering that when the income limit was exceeded, they should be transferred as soon as possible to the paying wards, and charged on that scale from the date of admission.

Discussion turned chiefly on the access of the practitioner to pay beds. Dr. C. E. S. FLEMMING (Bradford-on-Avon) said this was important to the practitioner, but more important still to the patient. Many cases required hospital treatment, not for operation or specialist's advice, but for the advantages an institution offered. The practitioner in the town where there was nothing corresponding to the cottage hospital was in a difficult position in regard to patients who required hospital treatment. The public was being deprived of the wealth of knowledge possessed by the young doctor to-day because there was no institution where he could carry out the work he was well equipped to do.—Mr. S. BRIGHT (Bournemouth) said in providing pay beds they were attempting to meet the needs of another class; the people who would occupy these beds knew their own doctor and wanted him. They should be allowed to have him—with safeguards.—Lord ARMSTRONG said that in Newcastle-upon-Tyne they had formed a paying hospital after considerable opposition, attributable to a fear that the paying patients would get all the attention. That had turned out to be a fallacy; the paying hospital relieved the ordinary beds and helped to maintain them.—Mr. A. H. LEANEY denied that hospitals were being opened to a new class. At Birmingham anyone who needed the services of the hospital could have them; if they could pay they were expected to do so. He could not see the difficulty about the practitioner; hospitals existed to give consultative treatment. The patient was handed back to the practitioner as soon as he was in a condition to be so treated. He hoped they would never separate the classes in hospitals by means of separate blocks.—Col. EGBERT LEWIS said that at the Forbes Fraser Hospital in Bath which was started nine years ago in connexion with the Royal United Hospital, outside practitioners sent in and attended their own patients; and this had always worked well.—Mr. S. LAMB (Liverpool) asked the conference to be clear what they meant by paying patients. Pay beds should be for that class who could not pay for their treatment privately. At least 75 per cent. of the salaried community had under £350 a year, and were dependent on voluntary hospitals. Would it not be kinder to introduce a contributory scheme for them similar to that for wage-earners?

Contributory Schemes

The last session of the conference was devoted to difficulties which had arisen between certain provincial hospitals and the Hospital Saving Association (H.S.A.), the basis of discussion being a memorandum detailing the negotiations between Sir Harold Pink on behalf of the B.H.A. and Sir Alan Anderson on behalf of the H.S.A. The complainant hospitals affirmed that their work had been hampered financially by the incursion of agents of the H.S.A. While feeling friendly towards it as a contributory scheme covering a clearly defined area, they took exception to the assumption that they were not competent to meet the requirements of residents within their own areas. In effect all they asked for was that they should be left undisturbed to carry on their proper work. The Council of the B.H.A. appointed a sub-committee to confer with representatives of the H.S.A., after which they drew up a series of recommendations which secured almost unanimous support. These set forth that it is vital to the existence of the voluntary system that there should be no competitive organisations for the raising of money in the same area, each contributory scheme confining its activities to its own recognised hospital area. The B.H.A. does not attach the same importance as does the H.S.A. to deductions from the pay roll at headquarters, preferring to leave each area to make its own arrangements; but, if deductions must be made, the money so collected should be handed over to a body representative of the recipient hospitals and distributed upon a basis of area membership. The benefits given in return for moneys so collected should in each particular case be those of the contributory scheme of the area in which the member is resident. Finally the B.H.A. deprecates the payment of commission or expenses to anyone collecting money for hospitals by contributory methods. Sir Alan Anderson in a statement made after consultation with the executive of the British Hospitals Contributory Schemes Association assured Sir Harold Pink that the policy of the H.S.A. is to coöperate with hospital contributory schemes, not to compete with them; adding that when the H.S.A. receives applications from an area covered by a hospital contributory scheme, its *general* practice is to refer applicants to the local scheme and to refuse to receive contributions from residents or employees in the area. There were however certain employments having their headquarters in London which desired cover for their employees wherever stationed. The Great Western and Southern Railways, for example, had adopted the H.S.A. as their official scheme, offering their employees facilities for the collection of contributions through the pay roll. In

these exceptional cases the H.S.A. received contributions irrespective of the place of employment or residence. He went on to make detailed suggestions how this situation could be met, offering to discuss with any hospital contributory scheme points, financial or otherwise, which might cause difficulty.

In opening the discussion Sir HAROLD PINK said that unless some satisfactory and prompt solution was reached he was afraid serious damage would be done to our voluntary hospital system. The H.S.A. was a contributory scheme started for London and London alone, but it now claimed the whole of the people belonging to a railway company with head offices in London, and might go on to take the Post Office and large trading companies with offices in London. It was wrong, he felt, to have two contributory schemes in any one area working on similar lines, because it might tend to destroy the confidence of the people—but the H.S.A. did not take the same view. Contributory schemes were evolved so that the working man might pay his weekly contribution on exactly the same lines as the person who gave a guinea or 50 guineas. They were subscribers to the hospital, and being subscribers naturally they looked upon their own local hospital as the one which would help them in time of stress. Each district was able to manage its own scheme and was willing to take railway people as well as others. He wanted to come to an arrangement with the H.S.A. to restrict their operations to London.—Mr. W. RAWLINSON (Bath) said the local contributory scheme was to a large extent the lifeblood of the hospital. It was their duty to see that it circulated. There must be no competitive spirit.—Mr. O. N. CHADWYCK-HEALY (vice-chairman) said that in his view the statement of the H.S.A. was founded on certain premises with which the provincial hospitals were not in agreement.—Mr. A. G. E. SANCTUARY (Oxford) said that if the word "invariable" was substituted for "general" in Sir Alan Anderson's statement there would be no further quarrel.—Dr. FLEMMING suggested that the H.S.A. had only come into the picture where there had not been a satisfactory contributory scheme in the neighbourhood. The way out of the difficulty was to ensure that in every area there was such a scheme, that it was properly coördinated and properly reciprocal.—Dr. L. S. LUCKHAM, J.P. (Salisbury), thought that contributory schemes should fall into line with voluntary hospital areas. They could not live apart.—Mr. LAMB said they had left contributory schemes to do the job hospitals should have done years ago; at this late stage they were now trying to get them under control.

The recommendations of the Council were endorsed.

MEDICINE AND THE LAW

Sterilisation and the Law

THE German project for a widespread programme of eugenic sterilisation on a voluntary basis—Saxony has now associated itself with the Prussian proposals—is a reminder that sterilisation is sometimes sought by individuals for other reasons than a patriotic desire to avoid propagating a stock which they recognise to be bad even though they represent it themselves. The reasons vary from a desire to be prevented from having children after rearing a large family to a desire for unrestrained promiscuity without the risk of affiliation orders. It is rumoured that a number of men and women are seeking sterilisation for economic reasons in this country. The law governing sterilising operations does not seem to be definitely laid down. They are not forbidden by any statute and their legality or otherwise must be deduced from principles of common law established a long time ago. In very early days it was an offence against the law so to injure a man as to render him a less able fighter, either in offence or defence. This was the crime of mayhem or maim. Castration, which in medieval times was often found a useful form of revenge by a jealous husband or a disappointed woman, was recognised as a serious maim, because it abated the victim's courage. Maim was essentially an offence against the State and not against the individual, for it was public policy that every able-bodied man should be as efficient a fighter as possible. For this reason no man could lawfully consent to be maimed. As times changed and the well-being of the State was recognised to depend on the efficiency not only of its potential soldiers but of all its citizens, the doctrine of maim became broadened to include every injury, committed on any person whatever, which caused serious physical harm. The Offences against the Person Act, 1861, Section 18, lays down that it is a felony punishable with penal servitude for life unlawfully to wound or to cause any grievous bodily harm. This section expressly makes the intent an element of the offence; no such element is necessary in the case of the similar misdemeanour punishable under Section 20. The extent to which express or implied consent can be relied upon as a defence is another important element. "Unlawful" wounding is wounding which cannot be excused or justified; by this word the ordinary surgical operation is excluded from the definition, for it is justified by the belief that it will improve health or save life, thus conferring a public benefit by bettering the citizen. When, however, an operation is not excused by a therapeutic aim, its legality becomes very doubtful, especially if its results may be considered contrary to public policy. Sterilisation is still regarded by the law of practically every country as against the public interests, for the well-being of the State is considered, rightly or wrongly, to depend to a large extent upon the number of its citizens irrespective of their quality. Lord Atkin, who discussed this matter before the Medico-Legal Society some years ago,[1] said that the surgeon who performed a maiming operation for merely economic reasons might find himself in very serious danger, not of a civil action, but of a criminal prosecution. If harm was done and death followed, he would certainly be charged with manslaughter; if the husband or wife of the patient dissented from the operation, someone would have a motive for prosecuting him. Lord Atkin considered that the sterilisation of a man might well fall within the class of maiming operations, but he was not prepared to say that the law of maim applied to such operations upon women, because the common-law principle, at the time of its formulation, did not consider women at all. In some Continental countries sterilisation is an offence against the criminal code. In Austria a few days ago a prominent Socialist and several accomplices, including a surgeon and three medical students, were put on trial for sterilising more than a hundred voluntary patients during the last two years. According to the *Times* (June 8th) the operations were performed in a desire to combat the evils of over-population and the economic crisis, and one of the material issues is whether the damage can be surgically repaired. This latter question would

[1] Trans. Med.-Leg. Soc., 1925, xix., 93.

not concern an English court, because grievous bodily harm within the meaning of the Act need not be permanent.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

POST-GRADUATE TEACHING IN BUDAPEST

Post-graduate medical teaching is no longer a national affair in Hungary. In recent years about one-third of those taking the courses have been foreigners, the surgical, obstetrical, and urological clinics of Budapest being a special attraction. To meet the requirements of our own doctors, in view of the difficult financial and economical conditions prevailing in Hungary, the Central Board of Post-Graduate Teaching has resolved to arrange courses in the larger provincial centres, as well as in Budapest. Doctors who cannot afford to take the courses without help and cannot get subsidies from their local authorities or from any other sources, will be provided with free board in the Physicians House in Budapest, others will get board at the same place at a much reduced tariff. The Central Board also makes daily allowances in certain cases, and even pays the fees of locum tenents. The Board is prepared to give leave to those holding official positions for the duration of the courses, which are to be entirely free, 5 pengö only (about five shillings) being paid as a registration fee. The courses last respectively for a fortnight and a month. Some of the Budapest clinics give tuition to post-graduates during the whole of the academic year. This year the new courses will be established in maternal and child welfare and the National Community Insurance Society announced new courses dealing with the following subjects: (1) The importance of a subnormal temperature in panel practice. (2) The basal principles of the criteria of incapacity. (3) Neuroses in court cases associated with accidents. (4) The accidental origin of internal secretion diseases. (5) The task of the physician in the prevention of accidents. (6) The function of psycho-technical institutes. Another new feature is the holding of courses on the economical management of public health institutions, for medical superintendents. The subjects dealt with will include hospital construction and management, medical technique, institutional feeding, and laundry work.

THE FIGHT AGAINST SPARROWS

A sharp dispute has arisen in medical as well as in lay circles in connexion with a proposal made by Dr. Desider Navratil, professor of laryngology at the University of Budapest. He wishes to destroy the sparrows which overrun the trees of the Elisabeth-place in the very middle of Budapest. The professor argued that these little birds are nefarious pests, because they defile the park of Budapest, which is used in summer by thousands of children and women, and find food on the scrap heaps round the city, eating the carcasses of dead animals, and thus spreading diseases. His proposal was to call the firemen on a night when the temperature is below zero and have the sparrows perching on the trees sprinkled with water. The theory was that the cold water would freeze on the wings of the birds and prevent them from flying and that they would drop down from the trees and could be swept up and taken to the municipal kitchens and made into nourishing soup for the poor. The council of the city of Budapest rejected this inhuman proposal.

A DIAGNOSIS CONFIRMED

The sad story leading up to the death of Dr. Imre Basch, lecturer in the University of Budapest and late director of the St. Stephen hospital, has caused much comment in medical circles here. Dr. Basch fell ill a few months ago with pain in his chest and difficult breathing. His professional friends assured him that his condition was not grave and was only a manifestation of arterio-sclerosis. Being sure that the truth was being concealed from him, he wrote to Prof. Finsterer of Vienna that he was sending him a patient for careful and thorough examination. He asked Finsterer not to give the diagnosis to the patient, but to write it direct to himself as the attending physician. Basch went to Vienna as the patient and when he arrived back in Budapest the letter from Prof. Finsterer awaited him. The patient, he wrote, suffered from cancer of the lung, the prognosis was of course most unfavourable, and the case would run a brief course and have a fatal termination. The death sentence did not much distress Dr. Basch, who was a bachelor, but he distressed his friends by throwing himself into a life of dissipation; this, it was thought, accelerated his death, which took place six weeks after his Vienna consultation. The deceased was of European fame as a dermatologist. His "Dermatology" is used in Hungary as a text-book. He wrote a whole series of treatises on the different subjects of dermatology. As a medical teacher he was foremost amongst all university teachers, as shown by the very great number of his hearers.

PARIS

(FROM OUR OWN CORRESPONDENT)

THE HEREDITARY FACTOR IN HYPERPIESIS

THE part played by heredity in hyperpiesis was statistically demonstrated by Prof. G. Etienne and Dr. G. Richard in a communication to the Academy of Medicine on May 9th. Their investigations represent several years of labour. Their material consists of 1150 patients suffering from chronic hyperpiesis, and of 82 controls who, though suffering from some valvular or functional disease of the heart, showed no hyperpiesis. Among the 1150 patients were 63 women on whom oöphorectomy had been performed in connexion with fibromas of the uterus (5·5 per cent.). There were also 92 (8 per cent.) suffering from renal disease, 97 (8·4 per cent.) suffering from serologically demonstrable syphilis, 261 (22·7 per cent.) showing no ailment to account for the hyperpiesis, and 637 (55·4 per cent.) with a family history of hyperpiesis. In one such family as many as 24 persons, distributed over four generations, were known to have suffered from a too high blood pressure. In another family there were 18 such cases in three generations. The average for three generations was three patients per family, whereas the proportion of hyperpietics per family among the 82 controls was only 0·1. How does hyperpiesis come to be a family disease? Prof. Etienne and Dr. Richard could not say, but they finished their communication with a remark which, though vague, is suggestive: "If it is possible, and even likely, that hereditary syphilis plays a part, the facts which we have collected are not sufficient to confirm this explanation."

THE POSSIBLE DANGERS OF SUN BATHS

While the public seems to be more than ever enamoured of the bronzed skin, medical science is

becoming more concerned with the number, variety, and seriousness of sun-bathing casualties. In Belgium the authorities have recently issued regulations under which the shrinkage of bathing costumes to limits approaching the vanishing point is forbidden. These measures have, apparently, been prompted by psychological rather than by material motives; they have evoked from Dr. Gaston L. Huysmans a critical survey of the whole subject in *Bruxelles-Médical* for May 21st. He quotes freely from the proceedings of the Second International Congress of Light held last October in Copenhagen, where some 300 specialists, representing 26 different countries, sat in judgment on the misuse, and even abuse, of sunlight. A further attack on the abuse of sunlight, in *La Presse Médicale* for May 20th, comes from another quarter. Editorial prominence is given to investigations recently conducted at the Pasteur Institute at Tangier by Dr. Remlinger and Dr. Bailly. The incident which first prompted their investigations was trifling. An attendant told to drown some rats in a trap left them meanwhile in the sun. Returning half an hour later he found them all dead. This struck him as a comparatively easy mode of destroying rats, and, preferring the path of least resistance, he henceforth systematically destroyed caged rats by leaving them in the sun instead of conducting a troublesome search for a barrel of water. At this point Dr. Remlinger and Dr. Bailly took up the systematic study of the action of sunlight on various laboratory rodents. They found that the white mouse, for example, died, on the average, after 18 minutes' exposure to the sun. They came to the conclusion that there was a complicated interplay of factors, thermal, luminous, and chemical, responsible for the various signs and symptoms leading up to the death of insolated rodents. It is, of course, a far cry from the drain rat to the human being who exposes his body to the sun; but the town-dweller who has spent all winter at work in sunless quarters should take warning rather than offence from the fate of the lower mammals whose normal subterranean life may be largely responsible for their susceptibility to insolation.

PROFESSIONAL SECRECY FOR THE NURSE

The French doctor who violates the code of professional secrecy may find himself in conflict with something much more tangible than any unwritten law or vaguely defined tradition of medical ethics. Article 378 of the Penal Code imposes professional secrecy not only on doctors but also on chemists, midwives, and all other persons whose professional duties may give them access to the secrets of a patient. A question has recently been asked as to the obligations in this respect of nurses. Can they be successfully sued in a court of law for gossiping about a patient? Dr. Paul Bodin, whose intimacy with forensic medicine is well known, has answered this question in the affirmative, although a distinction may perhaps be drawn between the whole-time professional nurse and she whose nursing is an incidental avocation. In 1864 a legal decision was given in which it was held that Article 378 of the Penal Code did not apply to persons who, under the charge of a doctor, might perchance be called to give some occasional service to a patient. The creation of this loophole for the escape of a too glib nurse from the penalties attaching to indiscretions of speech has caused grave concern among all interested in the preservation of the privacy of a patient's affairs; and in a much later judgment, given in 1897, it was ruled that even the secretary in the public health office of a mayor may not with impunity disclose secrets which he or she has acquired in the course of professional duties. On Feb. 16th, 1933, the legal position was made quite clear by a law modifying Article 378 of the Penal Code in the sense that everyone, even if his or her functions are temporary, professionally concerned with the secrets of a patient, must treat these as confidential information.

IRELAND

(FROM OUR OWN CORRESPONDENT)

IRISH MEDICAL ASSOCIATION

THE annual general meeting of this association was held in the Royal College of Surgeons, Dublin, on June 7th, with Dr. Robert J. Rowlette, the president, in the chair. There was a good attendance of members. The result of the ballot for officers and council was declared. Dr. Robert J. Rowlette was re-elected president, and Mr. Charles J. MacAuley was elected vice-president. The president's address dealt with the present position of the profession in the Irish Free State. He announced that there had been a substantial increase in the number of members of the association during the year, and that branches had been revived in several areas. There was still, however, a majority in the profession unattached to any association. Steps had been taken to coördinate the activities of the association with those of the British Medical Association in Ireland and of the Irish Medical Committee, so that united action might be taken where general interests were concerned, while each association remained free to protect the interests of its individual members. He referred to the present position of the Public Services (Temporary Economies) Bill as it affected the interests of members of the medical profession. The association decided to remit half the subscription of young practitioners within four years of qualification.

VITAL STATISTICS FOR 1932

The yearly summary of births, deaths, and marriages in the Irish Free State in 1932 has recently been issued.

The rate in 1932 per 1000 of the population represented by the *number of marriages* (13,085) registered in Saorstat Eireann was 4·4, as against 4·4 in 1931 and an average of 4·7 for the ten years 1922–31. The *birth-rate* in Saorstat Eireann during the year, based on 56,167 births, was 18·9 per 1000 of the estimated population, as against 19·3 per 1000 for 1931 and an average of 20·2 per 1000 for the ten years 1922–31. The birth-rate for the city of Dublin was 25·3 per 1000; for the borough of Dun Laoghaire, 16·7; for the county borough of Cork, 21·4; for Limerick, 25·8; and for Waterford, 26·1. For Northern Ireland the birth-rate was 20·0; for England and Wales, 15·3; and for Scotland, 18·6. The rate for Belfast was 21·5; for Londonderry, 26·1; for London, 14·3; for Glasgow, 20·6; and for Edinburgh, 15·5. The rate in respect of *deaths* registered in Saorstat Eireann, numbering 42,957, was 14·4 per 1000, as compared with 14·5 in 1931 and an average also of 14·5 for the ten years 1922–31. The death-rate for the city of Dublin was 15·7 per 1000; for the borough of Dun Laoghaire, 14·3; for Cork, 15·8; for Limerick, 15·7; and for Waterford, 18·3. The corresponding death-rate for Northern Ireland was 14·2; for England and Wales, 12·0; and for Scotland, 13·5. For Belfast the death-rate was 14·0; for Londonderry, 14·4; for London, 12·3; for Glasgow, 14·5; and for Edinburgh, 13·5. The mortality-rate represented by deaths in Saorstat Eireann from the *principal epidemic diseases* (comprising typhoid fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases) was 0·6 per 1000, as compared with 0·5 in 1931 and an average of 0·5 for the five years 1927–31. The death-rate from *influenza* was 0·5 per 1000, which was also the rate in 1931 and the average rate for the five years 1927–31. Deaths from *tuberculosis* (all forms) afforded a rate of 1·2 per 1000, as compared with 1·3 in 1931, and an average of 1·4 for the five years 1927–31. The rate for *pulmonary tuberculosis* was 0·9, as against 1·0 in 1931. Deaths from *puerperal*

conditions represent a rate of 4·2 per 1000 births registered during the year (1·4 per 1000 from puerperal sepsis and 2·8 per 1000 from other puerperal conditions), as compared with 4·3 in 1931 and an average of 4·5 for the five years 1927–31. The *infant mortality-rate* (deaths under 1 year of age per 1000 births registered) was 71, the rate for the year 1931 being 69, and the average for the ten years 1922–31, 70.

HONORARY DEGREES AT DUBLIN UNIVERSITY

The senate of the University of Dublin has passed graces for the following honorary degrees to be conferred in connexion with the annual meeting of the British Medical Association to be held in Dublin next month: *Sc.D.*—Emil Novak, Gordon Morgan Holmes, C.M.G. *M.D.*—Henry S. Souttar, C.B.E., Ernest K. le Fleming.

ROYAL COLLEGE OF SURGEONS IN IRELAND

The election of president, vice-president, and secretary was held, and the following were elected for the ensuing year:—President: Mr. Frank Crawley. Vice-president: Mr. Seton Pringle. Secretary: Sir Conway Dwyer. Council: Sir Thomas Myles, Mr. Louis Werner, Sir Robert H. Woods, Sir Conway Dwyer, Mr. Andrew Fullerton, Mr. Trevor N. Smith, Mr. Edward F. Stephenson, Mr. G. E. Pugin Meldon, Mr. Howard Stevenson, Sir C. A. K. Ball, Mr. R. Atkinson Stoney, Mr. Patrick E. Hayden, Mr. Edward Sheridan, Mr. William Pearson, Mr. Adams A. McConnell, Mr. T. O. Graham, Mr. William Doolin, Mr. W. C. F. Smyly, Mr. F. Gill.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

INTRAVENOUS ADMINISTRATION OF WHEAT GERM

In the belief that many patients with pellagra die because they are unable either to ingest the necessary food or to retain it if ingested, Dr. T. D. Spies, of the Cushing Laboratory of Experimental Medicine in Cleveland, decided to try parenteral therapy. From among the numerous diets, drugs, and minerals that have been recommended in past years for the treatment of pellagra he selected wheat germ. From this he prepared a solution rich in vitamin B and poor in lipoids and protein, and in the first place administered it in a 10 per cent. solution in normal saline to laboratory animals without any apparent injury. Dr. Spies then tried the same solution upon himself and upon 20 patients in the general medical wards of Lakeside Hospital. Six pellagra patients on a restricted diet were subsequently treated with repeated injections of this solution and showed definite improvement. Four pellagrins with severe vomiting were given intravenous injections without any food. After two or three days the stomatitis improved and the patients asked for food. This was no longer withheld and the patients recovered without further vomiting. The intravenous treatment was occasionally followed by a mild chill, and in one instance by a transient phlebitis. Dr. Spies presents these results without claims as to the therapeutic efficacy of the preparation, and points out that intravenous injections of wheat germ are only indicated when alimentary assimilation is not possible.

SALVARSAN REACTIONS IN THE U.S. NAVY

Since November, 1924, medical officers of the U.S. navy have been required to make monthly reports on the administration of arsenical compounds for the treatment of syphilis. A separate and detailed account is required of every case in which any untoward effects of treatment have been observed. These reports are published annually in the *U.S. Naval Medical Bulletin* and constitute a valuable clinical record. The April number of the bulletin gives the case-histories of such reactions occurring during the calendar year 1931—in all 62 cases, of which 30 are classified as "vasomotor phenomena (shocklike, nitritoid, anaphylactoid, &c.)." Reactions are apparently becoming less frequent, since the proportion of reactions to doses administered in 1931 was but 1 to 1676 compared with a ratio of 1 to 1171 in the six-year period 1925–1930. Since the year 1919, 40 deaths have been attributed to the use of arsenical compounds. No such death occurred during the year under review.

THE BIRTHDAY HONOURS

We regret the omission from the list of Birthday Honours, which appeared on p. 1257 of our last issue, of the following names:—

O.B.E. (Civil Division)

CLERMONT GRANTHAM-HILL, M.B., F.R.C.S.
Senior Surgeon to the Khartoum Hospital.

Captain MAURICE REVELL SINCLAIR, I.M.S.
On special duty with the Political Officer in Sikkim.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

THE following Surg. Lts. to be Surg. Lt.-Comdrs.: C. T. Hyatt, T. F. Barlow, and J. L. Malone.

ARMY MEDICAL SERVICE

Col. J. T. Johnson, late R.A.M.C., is placed on half pay.
Lt.-Col. H. C. Winckworth, from R.A.M.C., to be Col.
Royal Horse Guards.—Surg. Maj. E. D. Anderson to be Surg. Lt.-Col.

ROYAL ARMY MEDICAL CORPS

Maj. J. S. McCombe to be Lt.-Col.

RESERVE OF OFFICERS

Capt. A. Robertson, from Supp. Res. of Off., to be Capt.

TERRITORIAL ARMY

Maj. A. M. Johnson to be Lt.-Col.
Lt. A. Bowie resigns his commn.
Lts. W. C. Barber, from 8th Bn. Lan. Fus., A. H. Charles, from 19th Lond. R., and T. F. Briggs (late R.F.A. Spec. Res.) to be Lts.
2nd Lt. G. W. Molyneux (late Loyal R.) to be Lt.
Supernumeray for service with the O.T.C.—Lt. R. J. V. Pulvertaft resigns his commn.

ROYAL AIR FORCE

Flying Officer E. A. Gudgeon is promoted to the rank of Flight Lt.
Dental Branch.—Flight Lt. A. P. McClare relinquishes his temporary commission on completion of duty.

THE COLONIAL SERVICE

Dr. R. L. Chamberlain and Dr. J. H. Pierre have been appointed medical officers at Jamaica and Trinidad respectively. Dr. d'Arifat has been made Deputy-Director of Medical Services at Mauritius, and Dr. J. A. Henderson Surgeon-General, British Guiana.

PAY BEDS AT THE LONDON HOSPITAL.—At the quarterly meeting of Governors last week it was reported that as a result of conferences with the medical council a scheme for the provision of beds for paying patients had been adopted. It will be possible to provide some 35 beds without encroaching to any great extent upon those available for the general public. The difficulty of raising money for a special object simultaneously with the quinquennial appeal is recognised, but it is hoped to start a paying department for middle-class patients without undue delay. The quinquennial appeal had so far produced £34,172.

PUBLIC HEALTH SERVICES

Measurement of Malnutrition in School-children

In some quarters it is thought that the children are suffering from the poverty of their parents due to unemployment. There are many difficulties in the investigation of nutrition, the first being that of laying down exact standards. If the condition of a child could be stated in the terms of a mathematical formula, comparison would be much easier. Many attempts have been made to find a satisfactory equation, and an excellent précis of them is to be found in J. Kerr's "Fundamentals of School Health." Dr. Kerr emphasises the fact that there are many characters that to the trained eye denote malnutrition—anæmia, poor tone, lack of subcutaneous fat, dull eyes—and yet are not susceptible of measurement. He gives a table showing that the results obtained with Livi's formula do not agree exactly with the estimates of skilled observers, and that its use may fail to pick out really undernourished children. This formula, $\sqrt[3]{W} \div H$, an improvement of the simpler one of Quetelet—$W \div H \times 100$—is, he says, "based on the philosophical idea that it is mathematically unsound to compare a measure in three dimensions such as weight with an unidimensional one like height." Livi's formula involved the extraction of many cube roots, while that of Quetelet has a very fair general reliability, and is of value for practical work. In Leeds the simple formula—W in lbs. ÷ H in ins. × 100—has been used for a nutritional quotient, and the averages for 1932 are :—

Age-group.	Boys.		Girls.	
	Number examined.	Mean nutritional quotient.	Number examined.	Mean nutritional quotient.
4–5	550	93·6	505	90·9
5–6	930	96·4	900	93·6
8–9	1775	110·8	1545	108·9
12–13	1040	130·1	985	136·4

As a practical guide to inspecting officers, the following table was issued in April, 1932, giving the "low limit of subnormal nutrition"—a phrase which might with advantage have been defined in the text of the report.

Age-group.	Boys.	Girls.
	Low limit.	Low limit.
4–5	80	77
5–6	82	79
8–9	95	91
12–13	108	110

The benefit of supplying milk to school-children has been conclusively and finally demonstrated by Dr. Corry Mann, and yet in an investigation at Coventry the 9-year-old children who had milk gained less during the six months than those who did not have it. Probably, as Dr. A. Massey says, the explanation is that poor parents are more likely to be willing to pay for milk when their children are lacking in capacity for growth, but the very poorest cannot afford to pay for it, and their children get into the non-milk group although handicapped by the lack of it. The anomaly was confined to one small group of 26 children (at all other ages the milk-group showed superiority), and while it does nothing to contra-indicate milk schemes it does illustrate the difficulty of getting exact figures. In Dr. Massey's words :

"Weight and height are not necessarily true criteria whereby the effects upon health of milk administration can be assessed. They merely possess the advantage of enabling precise record. The degree of enhancement of resistance to infection is perhaps of equal importance. This, however, cannot be measured satisfactorily, although it is probable that school milk-supplies tend to increase the body resistance of recipients."

The question how far the nutrition of the children is impaired, directly or indirectly, by the economic depression is difficult to answer with certainty, but from the few reports of school medical officers for 1932 yet available, it would appear to be unusual. The cases of malnutrition found at medical inspections in Leeds were 2158 in an elementary school population of about 70,000. The table of heights and weights shows slightly lower figures there than last year, whereas the number of free meals supplied was 406,770 compared with 304,975 in 1931. In Sheffield there were 482 cases of malnutrition in a school population of about 73,000. The statistics of nutrition were : excellent 12·43 per cent., normal 76·09 per cent., below normal 11·47 per cent., bad 0·01 per cent.—and Dr. T. Chetwood's remark is "this is a slight improvement on last year, and there is still no evidence that malnutrition is increasing in this city." In Bootle there were 185 cases in a school population of about 11,000 as compared with 380 in 1931, and Dr. F. T. H. Wood, after remarking that nutrition is difficult to standardise, adds "it is, however, satisfactory to note that in spite of continued economic distress there has been no apparent increase in malnutrition." His comparative table of heights and weights for 1920, 30, 31, and 32 shows general improvement. At Edmonton there is no record of increased malnutrition, but the number of free meals has gone up from below 57,000 to nearly 113,000. In Leicester there were only 184 cases of malnutrition recorded in a school population of over 31,000 ; the total number of meals supplied was 16,714, and all the children in the infants' department were offered a third of a pint of milk. In Wigan it is noted that the heights and weights of the children were below the standard, but there were only 117 cases of malnutrition in over 12,000 children.

Some social workers are painfully aware of instances of mothers suffering from lack of food themselves because they have preferred to keep up the nutrition of their children, but of this naturally there is no statistical evidence. Others have noted that when the father has been out of work for a long time the whole tone of the household drops, and the mother becomes apathetic about the condition of the children ; when the man gets a job the improvement in the appearance of the children is obvious. In the Leeds report, Dr. G. E. Stockwell says :

"Children often receive free meals, free milk, and free cod-liver oil and malt, or any possible variation of any two of them. It may be that there is every justification for their use, but if so it is very necessary to see that the total diet value is adequate and spread over the desired period. The content of the school dinner is good, but no person can deal with the whole of his daily ration in one meal, and the provision of milk and a small portion of cheese, butter, lettuce, or an orange in turn, before school in the morning would do much to correct the present improper diet, which contains far too much carbohydrate. It is a fact that the children who are having both free meals and free milk show lower weights and heights than children who are fed at home either with or without an addition of milk. A breakfast of bread and stewed tea is not

satisfactory, and improvement would be expected physically and educationally, if there were a more adequate start to the day. The diet must satisfy all the criteria. If it is not complete in all four, it should be changed. No amount of calories will make up for other deficiencies, and no amount of vitamin or mineral matter will make up a shortage n calories or animal protein."

Dr. J. E. Spence, of Eccles, records only one case of malnutrition found at routine inspection but 86 at special inspections. "Prior to the Local Government Act, 1929, coming into force," he says, "malnourished ailing children requiring extra nourishment were referred to the guardians for assistance. It is, however, contrary to the spirit of the Act that children requiring such assistance should be referred to the public assistance committee. It was therefore decided to put the Education (Provision of Meals) Act into force, so that children certified by the school medical officer to be in need of extra nourishment can be assisted by the education committee. These children are seen periodically, and a certificate is issued on which is stated the defect for which treatment is necessary. Extra milk and/or cod-liver oil emulsion are ordered for a period not exceeding 14 days, at the end of which period the child is again examined."

On the evidence of these reports it would be fair to say that malnutrition in school-children is not common, but its comparative rarity must be due to the many active measures taken to combat it.

Research on Mental Disease at Birmingham

The annual report for 1932–33 of the Joint Board of Research for Mental Disease of the City and University of Birmingham, which has just reached us, records a large and increasing total of routine investigations which fully justify the financial aid received from the mental hospitals. Research work during the year has consisted of a continuance of the investigation into nasal sinus pathology and its relation to mental disease. Thick (250 μ) sections indicated pathological changes of the smallest brain arteries in cases of mental disorder; many of them were seen to contain ischæmic infarcts which would otherwise have been missed. The blood-supply of the cortex shows great variation in local areas, contrasting with the even distribution in normal (animal) brain used as a control. A prefatory letter from Sir Gilbert Barling, chairman of the Board, regrets the effect of economic pressure on the Board's work. The assistance of the Medical Research Council has been withdrawn, and the finances did not permit the reappointment of a research scholar. Sir Gilbert laments the lack of encouragement given to the proposed central laboratories for the midland district, and the failure to secure provision for special research laboratories in the scheme of the new medical centre.

Puerperal Fever at Plymouth

On May 8th, as already related (May 20th, p. 1094), Dr. T. Peirson, medical officer of health for Plymouth, reported to the city council on an outbreak of puerperal fever at the Three Towns Maternity Home, Stonehouse. The home was closed on May 9th for disinfection, and after some minor alterations will shortly be reopened. Dr. Peirson regards the cause of the outbreak as largely a matter of surmise, although the original source of infection was probably the presence of a hæmolytic streptococcus in the throats or noses of some of the nurses. There was no apparent connecting link between the cases which occurred on the district and those inside the home; the nurses who attended the district cases were sent away and were never in contact with the subsequent cases in the home. The high mortality amongst the cases—four deaths occurred—points to a virulent type of infecting organism. As in other outbreaks, several of the patients who developed fever had had a normal labour without interference of any kind. The committee of the home has now decided to appoint a medical officer whose duty it will be to supervise midwifery work as a whole. The matron will be able to ask for their assistance or advice whenever it is found necessary in individual cases. Rules for the use of masks and gloves are being laid down, to which doctors who visit the home, as well as the nurses, will be required to conform. Two additional trained nurses have been appointed to the staff. The large ward which at present contains 12 beds is to be divided into two by means of a glass partition, and each half will not be occupied in future by more than five beds. Representation has been made to the committee that major surgical operations should not be carried out in the home, in accord with the scheme whereby the city hospital was constituted the hospital centre for complicated midwifery. A new isolation unit, completely separate from the remainder of the building, is to be provided for use as an observation ward for pyrexial patients.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 3RD, 1933

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 27 (last week 16); scarlet fever, 2037; diphtheria, 785; enteric fever, 30; acute pneumonia (primary or influenzal), 832; puerperal fever, 36; puerperal pyrexia, 75; cerebro-spinal fever, 29; acute poliomyelitis, 7; acute polio-encephalitis, 2; encephalitis lethargica, 17; dysentery, 7; ophthalmia neonatorum, 62. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 6th–7th was as follows:—Small-pox, 56 under treatment, 0 under observation (last week 50 and 4 respectively); scarlet fever, 1716; diphtheria, 1656; enteric fever, 11; measles, 443; whooping-cough, 380; puerperal fever, 26 (plus 8 babies); encephalitis lethargica, 232; poliomyelitis, 1; "other diseases," 308. At St. Margaret's Hospital there were 15 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 41 (0) from measles, 4 (0) from scarlet fever, 20 (4) from whooping-cough, 20 (7) from diphtheria, 33 (11) from diarrhœa and enteritis under 2 years, and 29 (5) from influenza. The figures in parentheses are those for London itself, which, it will be noted, reported no death during the week from enteric fever, measles, or scarlet fever.

St. Helens reported the only death from enteric fever. Liverpool reported 16 fatal cases of measles, South Shields 3, Blackburn, Newcastle-on-Tyne, Sunderland, and Swansea each 2. There were also 5 fatal cases of whooping-cough at Liverpool.

The number of stillbirths notified during the week was 268 (corresponding to a rate of 39 per 1000 total births), including 27 in London.

INFANTS HOSPITAL, VINCENT-SQUARE.—The annual report of this Westminster hospital states that last year there were 835 in-patients, including 60 nursing mothers, and 2404 out-patients. The convalescent home received 124 patients, whose average stay was 57 days. The income was £14,547, which was £432 less than the expenditure. By the completion of the new in-patient block this summer and the alterations to the old building, the number of beds will be increased from 50 to 100. The cost of the extension scheme is £120,000.

PANEL AND CONTRACT PRACTICE

The Gap between Sickness and Unemployment Benefit

A PATIENT who is certified as incapable of work by his insurance practitioner (subject to the decision of his approved society and his right of appeal) in the usual course of events receives a sum of money weekly called sickness benefit. This continues until he is certified not to be incapable by his own doctor, but his payments may be stopped by his society if a regional medical officer of the Ministry of Health reports, after an examination, that he is not incapable of work.

The report of the regional medical officer is purely advisory, both to the insurance doctor and to the approved society. The society make the actual decision whether to stop or to continue sick pay (subject to the insured person's right of appeal). The delay which takes place, under the present system, between the date of stopping of sick pay by an approved society and the notification of it to the patient has often given rise to complaints, since whilst receiving sickness benefit he is not allowed to receive unemployment benefit (and vice versa). A question was recently asked in the House of Commons on the point by Mr. Buchanan, and the Minister, in his reply, indicated that a new procedure will be adopted to close this gap. The present procedure is that the regional medical officer reports to the insurance practitioner and to the society, both receiving his opinion the next day unless special investigation is required. But even if the report is "*not incapable*" and the society decides to stop benefit from the date of that examination, some days may elapse before the insured person is informed of this decision. During this time he often does not present himself at an employment exchange and thus fails to qualify for unemployment benefit. It has been suggested that this delay might be avoided if the regional medical officer informed the insured person that he thought him fit to resume work, but this course is open to obvious objections. The status of the regional medical officers is entirely advisory, and further, a communication of his opinion to the insured person might be taken to imply advice. The patient should be guided by the opinion of his own doctor, whom he should consult again as soon as possible after examination. His doctor will receive the regional medical officer's opinion the next morning and this would appear to be the best time for the visit.

The Ministry, with the concurrence of the Insurance Acts Committee, has accordingly made a new arrangement whereby, in the notice summoning an insured person to see the regional medical officer, he is advised that if he attends for examination he should see his doctor the following day. Whether doctors will welcome such an increase in their consultations remains to be seen, but provided they agree with the regional medical officer's report the interests of their patient will be best served if they sign him off the sickness benefit, so that without delay he may put in his claim for unemployment benefit. There would then be no gap between the receipt of the two benefits. The proposed scheme will also enable a doctor to review the patient in the light of the regional medical officer's report; for even if the opinion is that the patient is still incapable of work there may be some suggestion made in the report which may help in the treatment of the case.

It must, however, be strongly emphasised that the insurance doctor should not sign off as fit to work any insured person whom he thinks is incapable of work; and if he holds this view, in spite of a "not incapable" report by the regional medical officer, he should still continue to issue certificates of incapacity.

What is a Partnership?

A question of partnership obligations under the Insurance Acts arose as already reported at the last meeting of the London panel committee. It is pertinent to ask: what is a partnership? An insured person has the right to demand the personal services of the principal if attendance is being given by an assistant, whereas he is not entitled to demand those personal services if he is being attended by a partner, although in that case too continuity of treatment must be provided. It is therefore important to be able to distinguish between partner and assistant. The assistant is usually under agreement with the principal for a salary of £300 to £400 a year. The partner, too, may receive a fixed sum per year, but more often a share of the profits of the practice. The regulations provide that before a man or woman can be recognised as a partner in a practice the share received by him/her from the profits of that practice must not be less than one-third (in Scotland one-half) of any other partner's. This is to make certain that a man has an adequate interest in the practice, that he is a partner in deed as well as in name. The clause, however, would seem to work out differently from the intention under which it was created. Let us imagine a concrete example. A and B are the partners in a practice of approximately £4000 per year. A receives £3000, B receives £1000 as their respective shares. Under the English regulations they are recognised as partners because the share of B is not less than one-third the share of A. They work hard and are successful; the practice increases and the profits become £6000, of which A receives £4500, B £1500. A then decides it is time to take in a partner C, and he agrees with B to sell C a share of his (A's) profits equal to £500. The respective shares are then A, £4000; B, £1500; C, £500. Again under the regulations all are partners, because C's share is not less than one-third of B, and the regulation says "any other" partner. A now becomes mildly incapacitated and decides, with the assent of B and C, to sell to D a further slice of £175 from his own share. The shares will then be A, £3825; B, £1500; C, £500; D, £175. D's share is not less than one-third of C's, and he has therefore to be recognised as a partner under the regulations, although he is only receiving £175 a year from a practice which is producing £6000 or (say) half what he would receive for his services if A, B, and C employed him as an assistant. This can hardly have been the intention of the regulation. A question of this kind recently arose in an actual partnership case and led to discussion amongst those concerned as to the exact meaning of the words, "any other partner." It was argued on the one hand that if any partner's share is less than one-third of that of any other partner then he shall not be recognised as such under the regulations. And on the other that the negative in the phrasing of the regulation ruled out this interpretation: "A practitioner will not be deemed to be a partner unless . . . he is entitled to a share of the profits . . . not less than one-third of *any other* partner." It does not say "of *all other*

partners." The position is comparable to that of a partnership agreement in which it was sought to provide a test of the health efficiency of one of the partners. It was there provided that the partnership could be determined by B if A was prevented from doing either "this" *or* "that," both particular acts required in the treatment of cases. A could do "this," but he could not do "that." His legal advisers tried to argue that as he could do one of them B could not determine the partnership. Counsel's opinion was taken, and eventually it was agreed that B could determine the partnership. The trouble arose from the negative sense contained in the word "prevent"; so in the above phrase of the regulations the difficulty of interpretation arises from the words "not be deemed," "unless," and "not less than." So far as is known the clause had not previously given rise to any difficulty.

Return to Medical List

At the same meeting a point arose in connexion with a doctor's application to return to the medical list. Dr. X was struck off the list by the Minister in 1917, and now applies to be reinstated. Dr. Y, who purchased Dr. X's insurance practice when he was struck off, objects to his reinstatement. Both practitioners appeared before the ethical sub-committee and gave their opinions. Dr. Y based his objections on the grounds that:

(*a*) Dr. X was removed for a serious offence, and there was no suggestion at the time of any possibility of readmission.

(*b*) Dr. X retained his private practice and continued, and is still continuing, to carry on his private practice from his same addresses and amongst the same families as those in which he (Dr. Y) carries on insurance practice. He has therefore been to a very large extent in direct contact with a large proportion of Dr. Y's insurance patients ever since his removal from the medical list.

(*c*) A considerable proportion of Dr. Y's insurance patients are still in possession of their original medical cards bearing on page 1 the name of Dr. X as their doctor. Dr. Y contended that unrestricted readmission was likely to lead to confusion in the minds of his patients—in his opinion to his detriment.

(*d*) He had barred Dr. X out for ten years as he had been advised it was not possible to stipulate for a longer term.

Dr. X said there was no legal ground for objection. It had been stipulated that he should not practise as an insurance practitioner for ten years; 16 years had now elapsed, and he had kept his agreement to the letter. In reporting to the panel committee, the ethical subcommittee said: "We are of opinion that Dr. X is free of any legal obligation to Dr. Y. We think there is a moral obligation, but that this has no bearing on the question before the sub-committee . . ." This question of moral obligation raised some comments at the panel committee, which decided by 19 votes to 14 not to offer objection to the reinstatement of Dr. X on the medical list.

Medicines out of Hours

An insured person is provided with all necessary drugs and appliances either by the doctor who orders them, provided there is no chemist under contract with the insurance committee within one mile of the patient's house; or by a chemist who has signed an agreement with the committee to undertake the supply of drugs and appliances under the terms of that agreement. Where the insurance doctor does not supply drugs and appliances through his own dispenser he writes a prescription which should be marked "urgent," if issued at a time when the chemist's shop is closed. As this marking carries a special dispensing fee, it should not be used unless immediate dispensing is medically important. In any case it is the doctor's obligation to see that the patient obtains the medicament; he must supply it himself if there is no chemist reasonably available. This obligation has caused a complaint to be raised by a doctor in Alnwick who has drawn the Northumberland insurance committee's attention to the fact that there was no chemist's shop open on Sunday, March 12th, to dispense insurance prescriptions. The committee referred the point to their pharmaceutical service subcommittee for investigation. The arrangement varies in different parts of the country. In some places most of the chemists open for dispensing work at certain short fixed hours on Sundays and bank holidays. In other places all the dispensing is done by one or two chemists taking turn according to a rota, notices being placed in the windows that insurance prescriptions should be taken to Mr. A or B at such-and-such an address. Whereas in the earlier days of the Act many chemists lived over their shops and were therefore fairly easily available for duty at night time, even if it did mean getting them out of bed, to-day most of them lock up their shops at night; they live away, and are not available for night dispensing of urgent medicines. Under the regulations this throws more dispensing upon the insurance doctor, for which he only receives the small fixed sum per 100 insured persons on his list intended to cover the cost of medicaments usually administered by the doctor personally. The whole question of the supply of medicines out of ordinary hours would repay investigation.

A New Service at Birmingham

The scheme for a public medical service, shortly to be launched in Birmingham, is based on principles approved by the British Medical Association. Subscriptions are to be threepence per head per week, with a maximum of one shilling per family; subscribers must be in reasonably good health and not over 50 years of age. Subscribers over 50 will be accepted at sixpence per head per week instead of threepence. There is to be a central committee of control composed of doctors elected by their fellows from the various wards of the city. Out of hours service, maternity cases, and so forth are not included in the service.

Since National Health Insurance does not make provision for the wives and dependents of insured persons, sickness clubs have often been formed to provide a kind of insurance against doctors' bills. But all are not equally well conducted, and it is commonly thought that they should be supplemented, if not replaced, by a single big scheme.

ANTI-GAS PRECAUTIONS IN BELGIUM.—The executive committee of the Belgian Faculty of Medicine has been considering the position of the doctor called to give assistance during bombardment by gas bombs. The committee enunciates the necessity for every doctor to possess an efficient mask in order to work freely in all zones, however dangerous. By arrangement with the Ministry of Defence any Belgian doctor who applies before July 1st to the *Bruxelles-Médical*, enclosing a fee of 150 francs, will receive from the military authority a permit to possess a mask of his own on the first day of mobilisation. In time of peace his mask will be preserved for him in suitable fashion at the local constabulary. The mere possession of a mask would not however go very far without practice in using it. The medical faculty is therefore getting into touch with the military authority so as to arrange for regular practice with these masks in gas-chambers. The *Bruxelles-Médical* appeals to every medical man in Belgium, whatever his age or position, to apply at once in order that the list may be sent to the Minister of National Defence.

CORRESPONDENCE

THE POOR-LAW SICK WARDS

To the Editor of THE LANCET

SIR,—I have read Mr. W. D. Bushell's article in your issue of May 27th (p. 1160) with great interest. If I take him aright he suggests that in some respects the Local Government Act of 1929 was misguided, in that municipal authorities were encouraged, nay even directed, to deal in their public hospitals with the acute sick. May I as the superintendent of a voluntary hospital and as a coöpted member of the central public health committee of the London County Council—as one therefore seeing something of both sides of this question—comment on one of Mr. Bushell's statements. He says :—

"As between these two groups of institutions (the voluntary hospitals and the poor-law infirmaries) the chronic sick have been by custom allotted to the poor-law sick wards, and the surgical and acute sick to the voluntary hospitals."

In London at least for many years previous to the passing of the Local Government Act this has not been true. Many of the poor-law infirmaries were adequately equipped by enlightened boards of guardians to afford institutional treatment to the acute sick of a standard almost if not quite comparable to that provided in the voluntary hospitals. The real effect of the passing of the Local Government Act, one of the greatest pieces of social legislation of our time, has been : first, to remove the institutional treatment of the sick, whether acute or chronic, from within the province of the poor-law, and to separate sickness from pauperism ; and secondly, by centralising the institutional treatment of the sick in London under the L.C.C. to raise its general standard.

It would be impossible in London to perpetuate the division that Mr. Bushell suggests, for the reason that the voluntary hospitals cannot cope with all the acute sick, and they could not, in these times of financial stringency, find the money to enlarge their hospitals sufficiently to do so. To give some idea of the numbers of acute and serious cases treated in L.C.C. hospitals, I offer some figures for 1931 which have been supplied to me from County Hall :—

Influenza and influenzal pneumonia	2,434	Valvular heart disease and myocardial diseases	5,590
Erysipelas	1,050	Lobar pneumonia	2,094
Septicæmia : pyæmia	1,247	Other pneumonias	4,183
Carcinoma	3,423	Gastric or duodenal ulcer	1,748
Sarcoma	117	Appendicitis	2,736
Rheumatic fever and acute rheumatism	1,271	Nephritis	958
Diabetes	567	Stricture of urethra	219
Cerebral hæmorrhage	1,877	Accidents	13,231

The list of operations is no less impressive. In 1931 they numbered 31,063, and included among others the following :—

For mastoiditis	490	For strangulated hernia or intestinal obstruction	775
For appendicitis	2,426	For malignant disease	513
For gastric or duodenal ulcer (including 315 for perforation)	500	For fractures	1,333
		Amputation of leg	166

No public body such as the L.C.C. with this volume of serious work put under its control could consent to provide merely a second-class medical service. It must for its own credit and as a public duty do its best so far as its finances permit to make its appropriated general hospitals thoroughly efficient for the treatment of the acute sick as well as of the chronic. In addition there is an increasing tendency to abandon the old type of "mixed institution" and to provide special institutions for special diseases and also for chronic cases. In short, the result of the Local Government Act has been to set up two general hospital services in London, the voluntary and the municipal—and in my opinion competition between them is good for both. One can learn a great deal from the other, to the eventual benefit of the sick of London.

I do not think that the competition of the L.C.C. will destroy the voluntary system in London. Certainly as far as I have seen within the walls of the County Hall there is no desire on the part of the L.C.C. to absorb or to control the voluntary hospitals. The financial burden would be immense, and the L.C.C. has enough to do for years to come to put its own house in order and generally to bring all the institutions now under its control up to a proper standard of medical service and of nursing. On the other hand the charitable public still appears to desire to continue to support the voluntary hospitals. Year after year, even in these hard times, the voluntary hospitals as a whole are paying their way, and the enormous growth of contributory schemes such as the Hospital Saving Association is evidence of the affection in which the voluntary hospitals are held by the people who know them best—viz., the sick poor. The teaching hospitals will always from their very nature lead the way in advance and research, but as patients are to some extent selected for admission to them on educational grounds, there is a collateral need for the institutional treatment elsewhere of cases which though not admitted to the teaching hospitals require efficient medical and surgical treatment for serious and acute illness.

Times have changed and are changing, and we must all adjust ourselves to a changing world. The only criterion of our work is the public welfare ; and with the increasing complexity of diagnosis and the growing expense of adequate treatment there is now a demand for the institutional treatment of the acute sick in London which the voluntary and the municipal hospitals together find it difficult to meet.

I am, Sir, yours faithfully,

HERBERT L. EASON.

Guy's Hospital, S.E., June 8th, 1933.

ÆTIOLOGY OF "CATARRHAL" JAUNDICE

To the Editor of THE LANCET

SIR,—In an annotation on p. 1246 of your issue of June 10th Dr. Theodor Brugsch's observations are taken to confirm the view that catarrhal jaundice begins as a "jaundice of the liver-cell." In a paper which will appear in the October number of the *Guy's Hospital Reports*, Dr. C. Keith Simpson and I have shown that this view is incorrect, and has arisen during the last few years as a result of confusion between two entirely distinct conditions. The symptoms of catarrhal jaundice, as observed in England, show very little variation from the picture drawn by Murchison in 1868 :

"A furred tongue, loss of appetite, flatulence, nausea or vomiting, pain and tenderness at the epigastrium, and sometimes diarrhœa, these symptoms being often accompanied by slight pyrexia. After a few days jaundice appears, and the fever, if present, subsides."

These are just the symptoms one would expect to result from acute gastro-duodenitis spreading to the mouth of the common bile-duct, which consequently becomes obstructed, a condition which was first described by Virchow in 1865. I know of only six post-mortems on cases of catarrhal jaundice, and in each of these acute gastro-duodenitis with obstruction

of the mouth of the common bile-duct by inflammatory swelling of the mucous membrane, in two instances accompanied by plugs of mucus in the lumen, was observed with an intact liver. Perhaps the most striking was one described by Eppinger in 1908, as he had previously come to the conclusion that the condition was a result of hepatitis. The patient was a girl of 19, who killed herself the day after admission to hospital in a typical attack. The liver was perfectly normal, but the bile-ducts were dilated as a result of complete obstruction of Oddi's sphincter by inflammatory swelling secondary to gastro-duodenal catarrh. We have found no clinical evidence of hepatitis in our cases, in none of which was any sign of hepatic insufficiency revealed by the lævulose test.

The condition described by Dr. Brugsch is very much less common in England than true catarrhal jaundice, though the reverse appears to be the case in Germany. The clinical picture is quite different, as the initial gastro-duodenal symptoms are absent, and the jaundice is accompanied by symptoms of general toxæmia. The lævulose test shows hepatic insufficiency, and in severe cases death occurs from hepatic necrosis. A boy of 16 was recently admitted to Guy's Hospital with jaundice and symptoms of severe toxæmia without any preceding gastro-enteritis. He developed broncho-pneumonia, from which he died. At the post-mortem Dr. Keith Simpson found early hepatic necrosis with perfectly normal bile-ducts and duodenum, exactly the changes found by Eppinger and other observers in similar cases.

It is clear that what is commonly known as catarrhal jaundice is well named, as it is caused by inflammatory obstruction of the mouth of the common bile-duct secondary to acute gastro-intestinal catarrh, the liver being unaffected, and that it is quite distinct in its clinical, biochemical, and anatomical characteristics from the mild cases of hepatic necrosis, which have been confused with it, and have led to the unfortunate statement in the latest edition of the Nomenclature of Diseases that "catarrhal jaundice" is a synonym for "common infective hepatic jaundice."

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, June 12th, 1933.

MEASURING A HEALING ULCER

To the Editor of THE LANCET

SIR,—It occurred to me, while dealing with cases of gravity ulcer, that the usual method of estimating progress in square inches was in some respects misleading. When the floor of an ulcer is reasonably clean and healed to an appropriate level we are only concerned with the lateral ingrowth of the epithelium. Now its advancing edge, though irregular in outline, tends to diminish in length. With the majority of ulcers, if the mean of the longest and the shortest diameter be taken, we may obtain a fairly accurate measure of the circumference from the formula $2\pi r$. Similarly there will be no gross inaccuracy if the area be taken as πr^2 for the same value of r, the ulcer being thus reduced to a true circle.

Now in healing towards its centre we may assume that the behaviour of any segment of the ulcer is representative of that of the whole figure. If then a segment be taken of which the base, a part of the circumference of the circle, be of unit length, it is again possible, with little inaccuracy, to consider it as a right-angled or isosceles triangle of which the area is equal to the base multiplied by half the height, or r. If now we wish to estimate the results of treatment we must remember that if healing continues at a uniform rate then an edge of epithelium of standard length will advance at an even speed towards the centre. But since the base of our triangle tends to shorten as it advances a correction is necessary to allow for this. The process may be likened to a concentric attack on an objective represented by the centre of the ulcer; it is a nice point whether or not the crowding of the front line, if the total impetus behind the attack remains unchanged, should lead to a more rapid or a slower advance.

I am not mathematically minded enough to pursue the matter much further, but it appears to me that, after reducing it to a simple geometrical figure, it should be possible to predict for any ulcer a curve representing healing at a uniform rate of advance of its epithelial edges. It by no means follows that healing in this way would cause a reduction in area of the same number of square inches week by week. I explained my difficulties to an engineering friend who immediately produced a slide-rule and became very enthusiastic. Unfortunately I was unable to follow the explanations he gave me but perhaps some reader of THE LANCET would care to tackle the problem. There is no particular virtue in using a circle to illustrate my point; in some ways a parallelogram would be easier to handle.

I am, Sir, yours faithfully,

G. C. PETHER.

St. Charles' Hospital, London, W., June 6th, 1933.

HOSPITALISATION OF SCARLET FEVER

To the Editor of THE LANCET

SIR,—In your leading article of June 10th you say:

"From the point of view of the public health administrator, however, the conclusion of outstanding importance drawn by Miss Woods from her analysis is that during the period studied no evidence has been found to prove that hospital isolation has been effective in reducing the prevalence or mortality from scarlet fever."

I am afraid I cannot accept lack of statistical evidence as a proof that hospital isolation has had no effect on the mortality from scarlet fever. During the years 1909–12 I saw many cases of scarlet fever successfully treated in the Manchester corporation isolation hospital, Monsall, which would certainly not have recovered had they not received hospital treatment, and I see no reason to doubt the same was occurring in most of the big cities about that date.

I am, Sir, yours faithfully,

STEPHEN ROWLAND,
M.O.H., Northampton.

June 12th, 1933.

To the Editor of THE LANCET

SIR,—There is at least one clinical event in the course of this disease which, when it occurs, calls for hospital treatment, at all events among the ordinary population—namely, acute purulent otitis media. No doubt this complication, like every other in the disease, varies greatly in its effect upon the death-rate. But in one respect, which does not figure in the bills of mortality, it varies but little, and that is that, when inefficiently treated, it is apt to pass into chronic suppuration with all its attendant disabilities and dangers, not the least of which is deafness, and it may be severe deafness. At this very moment I have under my care a small boy who, by reason of inattention to this complication in his attack of scarlet, has been rendered so deaf that he will have to attend a special school for his education.

Of recent years, that is to say since otological surgeons have been given charge of ear cases in isolation hospitals, calamitous results of this kind

have become much less frequent than they used to be. By expert care and appropriate treatment the disease is cut short and the child passes out into the world with dry ears and perfect hearing. In consequence, the amount of chronic suppuration of the middle ear with its consequent deafness (to say nothing of its risks to life) has undergone considerable diminution among the general population.

Let it therefore be accepted that one important reason for treating a scarlet case in hospital is the onset of acute otitis media. I may add that, as far as my experience goes, the antiscarlet serum seems to have little or no influence upon the occurrence of that complication.

I am, Sir, yours faithfully,

DAN MCKENZIE.

Weymouth-street, London, W., June 12th, 1933.

A NEW ANALGESIC DRUG ON TRIAL

To the Editor of THE LANCET

SIR,—A medical friend of mine in London has called my attention to the leading article, in your issue of May 20th (p. 1079), dealing with the claims made for Dilaudid as a substitute for morphia in relief of pain, and without its danger of habituation. You quote Dr. N. B. Eddy's opinion that it would be wise to postpone the clinical use of this new analgesic drug until the knowledge of its pharmacological action is more complete. As a matter of fact dilaudid is in very frequent use as a narcotic in this country. It was at first thought that it was devoid of the drawbacks of morphia and many of its substitutes—namely, danger of addiction, the necessity to increase the dose, troublesome side-actions such as constipation, dyspepsia, and depression of the respiratory centre; but we now know that dilaudid has these drawbacks in a lesser degree while highly active in relieving pain and spasm. Dr. Eddy is right in emphasising the fact that, when any long-continued employment is necessary, dilaudid must be given with the same precautions as morphia. With us it has proved especially useful in cardiac asthma, angina pectoris, and other night alarms, when it acts like morphine as a relief to the heart. In combination with quinine and cardiazol it has its use for the diminution of cough in pneumonia and bronchitis, especially when there is cardiac weakness.

I am, Sir, yours faithfully,

Wiesbaden, June 11th, 1933. Prof. Dr. DETERMANN.

SOCIALISATION OF THE MENTALLY DEFECTIVE

To the Editor of THE LANCET

SIR,—May I be allowed to correct a wrong impression which may have been created by the leading article in your issue of June 10th dealing with an address recently given by me on the Socialisation of the Mentally Defective. I made no claim that socialisation is a new idea. It is discussed at considerable length both in the Wood report and that of the B.M.A. committee. It is the justification for the provision of day special schools by local education authorities, who do not regard them primarily as stepping-stones to institutional care, but as serious attempts to make defectives fit for some form of social activity in the community. These attempts are, as I tried to demonstrate, successful in a fair percentage of cases, but my address was essentially a plea for an extension of the idea by the provision of more residential accommodation with occupational training to be carried on even beyond the official special school age for types of defectives likely to benefit. I am convinced that many of our day special school failures would in this way be "socialised."

Our present provision for defectives in England is too exclusively for the ineducable cases, for whom "permanent care" is, of course, the only policy. We are neglecting to canvass the possibility of socialising the educable defectives to the extent that experience elsewhere, and in a very few English institutions, shows to be feasible. I am not quite sure whether the statement in your article that "very few need permanent care in institutions" is intended to be attributed to me. If so, it credits me with rather greater optimism than I claim.

I am, Sir, yours faithfully,

Stockport, June 12th, 1933. HENRY HERD.

THE TREATMENT OF ACUTE APPENDICITIS

To the Editor of THE LANCET

SIR,—I have read with great interest the article in to-day's issue of THE LANCET (p. 1229) by my friend and colleague, Mr. R. J. McNeill Love, on the expectant treatment of acute appendicitis. Beyond stating that it is my practice, except in obviously subsiding cases, to operate as soon as possible after a diagnosis has been made, and that neither I nor my patients have ever had reason to regret such a procedure, I do not propose to discuss the relative merits of immediate operation and expectant treatment; this question has been fully dealt with in the medical press and elsewhere during the last few years.

But I do feel that Mr. Love, in his zealous advocacy of expectant treatment, has imputed to those of us who do not agree with him methods of operating which we should never dream of using, for we know their dangers as well as he does. The appendicectomy which is, to quote Mr. Love, "extremely difficult" involving "prolonged searching and considerable trauma to tissues" is not undertaken by the advocates of immediate operation. "Congestion and turgidity of the bowel and omentum," "friability of tissues," and "the presence of adhesions" are recognised as "stumbling-blocks," and the experienced surgeon, if he finds them, leaves them severely alone, does not make a "prolonged search" for the appendix, and unless the latter is easily found and delivered he makes no attempt to remove it in such unfavourable and dangerous circumstances; he contents himself with providing a safe outlet to the surface for the pus. Mr. Love also suggests that by the separation of adhesions we encourage secondary abscesses; so we might if we separated adhesions in the presence of acute septic inflammation but, as already pointed out, such is not our habit.

The infection of the abdominal wall is not a grave matter, and does not cause a weak scar or post-operative hernia if the incision is of small size and is the muscle split of McBurney; of course, not only weak scars but actual tragedies do occur if drainage is established through the rectus sheath. Lastly, speaking from my own experience, fæcal fistula is rare after an operation for appendicitis, and depends less upon the presence of a drainage-tube than upon sloughing from the spread of infection to the base of the appendix and adjacent cæcal wall.

The immediate operators are not such crude and clumsy craftsmen as Mr. Love would suggest. We have thought out our methods and continue to follow them because we are convinced that, in our hands at least, they are the safest.

I am, Sir, yours faithfully,

R. A. RAMSAY.

Gloucester-terrace, W., June 10th, 1933.

THE MISAPPLICATION OF ARTIFICIAL PNEUMOTHORAX

To the Editor of THE LANCET

SIR,—May I express the profound hope that all your readers will take the advice given by Dr. H. Batty Shaw in his letter in your issue of June 10th, and will read, learn, and inwardly digest the article to which he refers—namely, The Value of Artificial Pneumothorax, by Dr. Cedric Shaw, in the April number of the *Quarterly Journal of Medicine*. It is almost unbelievable, yet true, that at the present time there are many members of the profession who tell their patients and their colleagues that they "do not believe in artificial pneumothorax treatment," and some who send their patients to a sanatorium "on the condition that artificial pneumothorax treatment will not be undertaken." In some cases this is comparable with sending a case of acute appendicitis or acute mastoiditis to hospital on the condition that no operation is done; for the ultimate harm done by depriving the patient of the appropriate active treatment may be just as great, although not so quickly evident.

There are other cases of pulmonary tuberculosis, however, in which it is right to wait and to give the patient a chance of healing by rest in bed, before subjecting him or her to the admittedly small risks of artificial pneumothorax treatment.

I am, Sir, yours faithfully,

F. H. HUNNARD,
Assistant Physician, Pendyffryn Hall Sanatorium.

June 11th, 1933.

STIPPLING OF RED BLOOD-CELLS

To the Editor of THE LANCET

SIR,—It is remarkable how tenaciously certain hæmatologists of repute cling to the old conception that stippling of the red cell is a purely degenerative phenomenon. In their article in your issue of June 3rd (p. 1173) Dr. Whitby and Dr. Britton have demonstrated once again in a very convincing manner the relation of stippled and polychromatic cells to the reticulocyte, which latter is almost universally acknowledged to be an immature red blood-cell. They are to be congratulated particularly on the accuracy they have attained in the enumeration of polychromatic cells and the excellent controls they have tabulated.

In studying this same question I was able to show in 1928 (Jour. Path. and Bact., xxxi., 277) that, in patients undergoing treatment of cancer by lead, the appearance and increase in number of stippled cells often closely paralleled but never exceeded the rise in the number of reticulocytes which followed the lead injections—thus strongly suggesting that the stippled cells were included in the number of the reticulocytes and were therefore themselves immature red cells. I followed up these observations by a morphological study of reticulocytes, employing different concentrations of cresyl blue for precipitating their basophil material. I found that, using weaker concentrations of cresyl blue, it was possible in normal bloods to produce at will appearances indistinguishable from stippling in cells which, with stronger concentrations of the dye, showed typical reticulum. Dr. Whitby and Dr. Britton express some scepticism, apparently founded on their inspection of an admittedly not altogether satisfactory camera lucida painting which appeared in my paper, as to the validity of these conclusions; I may perhaps be pardoned for emphasising, on the grounds of some experience in the type of work in question, the genuine nature in so far as morphological appearances can be relied upon, of these artificially produced stippled cells.

In this connexion it is interesting to note that Dr. Whitby and Dr. Britton have confirmed the observation of Schwaz and Hefke and others that the number of stippled cells appearing in the film is influenced by the method of staining employed. I pointed out in my paper that it is doubtful if stippling is present as such in the circulating red cell, and that it would rather appear that the basophilic material is so altered as a result of the effects of lead that it is clumped into the characteristic granules at the moment of fixation. The suggestion, advanced by Dr. Whitby and Dr. Britton, that this alteration occurs in the bone-marrow is an interesting one and, if upheld, would go far to explain why the addition of lead to red cells in vitro does not cause stippling.

I am, Sir, yours faithfully,

R. W. BROOKFIELD.

Liverpool, June 12th, 1933.

PARLIAMENT

Reassembly after Whitsuntide.

BOTH Houses of Parliament reassembled on Tuesday, June 13th, after the Whitsuntide recess.

UNIVERSITY COLLEGE, LONDON

OPENING OF THE NEW ZOOLOGY BUILDINGS

On June 12th the Earl of Athlone, Chancellor of the University of London, who earlier in the day had unveiled within the precincts of the new zoology buildings a mural tablet to the memory of Sir Gregory Foster, the first provost of the College, formally opened the new home for the department of zoology and comparative anatomy. On the platform were Sir John Rose Bradford, chairman of the College committee, who presided; the Chancellor; Prof. L. N. G. Filon, the Vice-Chancellor; Mr. Allen Mawer, Litt.D., the Provost; and Prof. D. M. S. Watson, the Jodrell professor of zoology. Among those present were: H.R.H. Princess Alice, Countess of Athlone; Lady Bradford; Sir G. Buckston Browne; Sir Henry and Lady Dale; Mr. and Mrs. H. E. Dale; Mr. Edwin Deller, LL.D., Principal of the University; Mrs. L. N. G. Filon; Sir Ernest and Lady Graham-Little; Dr. and Mrs. A. M. H. Gray; Sir Frederick Hobday; Dr. George MacLean; and Dr. A. J. Rodocanachi. Sir John Rose Bradford in opening the proceedings paid a warm tribute to the services which University College had rendered to science in the department of zoology and comparative anatomy, and in particular referred to the work of Prof. R. E. Grant, who delivered the first course of lectures when the department was founded in 1828, and to that of Burdon Sanderson, both of whom had played a very great part in biological teaching. Lord Athlone then declared the new buildings open and in doing so said that the courtyard which the buildings surrounded had been named Foster Court, as a tribute to the first provost. To ensure an adequate training for students of zoology it had been necessary to provide staff and laboratories for the study of genetics, comparative physiology, and animal behaviour. Through the generosity of the Rockefeller Foundation, the London County Council, and that of Dr. Rodocanachi, it had been possible to establish posts in the subjects he had mentioned and to provide those who might be appointed to them with the laboratories, equipment, and library facilities which they needed. Prof. Watson, in proposing a vote of thanks to Lord Athlone, said that the College had been fortunate in obtaining the services of Mr. J. B. S. Haldane as professor of genetics.

The new buildings, which were originally occupied by Messrs. Shoolbred, contain space in the basement for the cooling plant, which will supply brine to rooms and aquaria at constant temperature. On the ground floor are the Lankester theatre, classrooms, a workshop, a laboratory, and aquarium; on the first floor laboratories and research rooms with the staff common room and professors' rooms; on the second floor laboratories, store and preparation rooms, and a museum. The new main staircase occupies the eastern half of an internal tower which has been carried up so as to provide a small fourth floor and a flat roof on which now stands a greenhouse. On account of the simplicity of the original structure it has been possible, with Prof. A. E. Richardson's help, to design each of the rooms to fulfil its particular purpose.

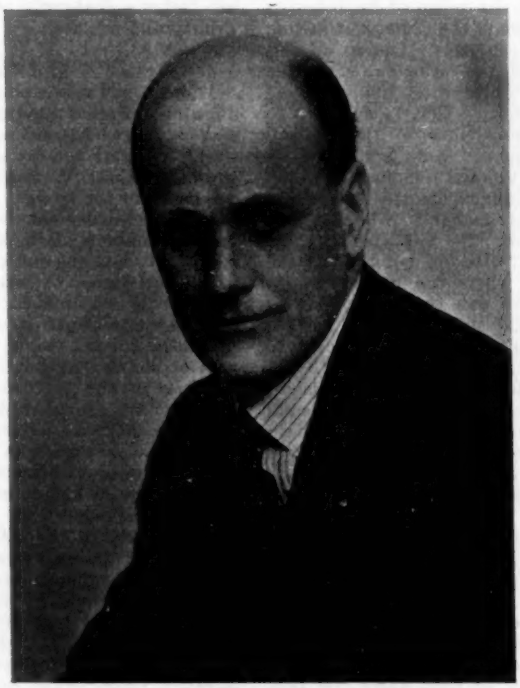
OBITUARY

SIR WALTER FLETCHER, K.B.E., C.B., M.D. Camb., F.R.C.P. Lond., F.R.S.

SECRETARY OF THE MEDICAL RESEARCH COUNCIL

WE announced last week the death of Sir Walter Fletcher, the secretary of the Medical Research Council, which occurred on June 7th at his house in Kensington following upon an operation.

Walter Morley Fletcher was born at Liverpool in 1873, the sixth son of Alfred Evans Fletcher and Sarah Elizabeth, daughter of Richard Morley, of Leeds. He entered Trinity College, Cambridge, in 1891. He was a science scholar, and graduated in 1894 with first-class honours in the Natural Science Tripos, physiology being one of his special subjects. He continued to work in the physiological laboratories of the University, where he soon became senior demonstrator, and where he was associated with many valuable researches, contributing an individual share which gained him the F.R.S. at an early age. This work is set out in detail in communications to the *Journal of Physiology* between 1902 to 1913, and includes classical investigations into the biochemical basis of muscular contraction, as shown by the relations of oxygen supply to muscular activity, the osmotic properties of muscle, the significance of lactic acid in muscle, and the association of heat rigor with intramolecular oxygen. While thus engaged in the laboratories he pursued the ordinary medical course, graduating as M.B. Camb. in 1900, after completing his clinical studies at St. Bartholomew's Hospital. He continued to pursue the purely scientific side of his subjects; he was elected a Fellow of Trinity in 1897, where, as in the University laboratories, he manifested his high and sympathetic qualities as a teacher. The fact that he was president of the Pitt Club at Cambridge for 15 years is evidence in itself of his acceptability to the successive generations of undergraduates. In 1904 he became tutor of the College, was proctor in 1904 and 1905, and was completing his term of ten years' tutorship when he was invited by Lord Moulton to become the secretary of the Medical Research Committee, a body just set up and functioning in connexion with the administration of the National Insurance Acts. Almost immediately after his acceptance of this position the outbreak of war occurred, and the resources of the Committee were at once placed at the disposal of the nation for their best employment both in the solution of military problems and in the maintenance of national health.



SIR WALTER FLETCHER

[*Photograph by Elliott and Fry*

At the outset there were many who viewed Fletcher's appointment with misgiving. He had won academic distinction, but in a very special field, and had shown himself to be a good administrator, but again in the conduct of affairs at an ancient university where precedent and unwritten laws would often replace initiative. With the commencement of hostilities responsibilities fell upon his shoulders as executive officer of a brand new association, the purposes of which had to be completely changed within a few days of its constitution. How well Fletcher succeeded the medical history of the war proves. He had been little more than a month in office when the storm broke, and his administrative qualities were put to rigorous test. The solution of scientific problems of every description was urgently called for. At home and abroad, in military and in civil circumstances, questions arose every day of a different sort, and much of the work had to be done under the material difficulties of improvised premises and rapidly changing personnel. Fletcher had to do things largely as seemed good to himself, for no one could have set any pattern before him or his immediate authority; further, the things had to be done while the country was wholly under a military control, which often forbade on larger grounds the adoption of otherwise useful measures. He was a man of particularly fine physique—a "hurdling blue" in his undergraduate days—but in 1916 it seemed as though the strain would be too much for him. He had a severe illness, from which, however, he appeared to have made a perfect recovery when he again took up the reins. At the conclusion of the war there was no doubt that the status of the Medical Research Committee—now reconstituted as the Medical Research Council functioning under the Privy Council—stood high in the esteem of the country, while the Government was rapidly and regularly turning with trust to it for advice. In 1918 he received the K.B.E.

The Medical Research Council, restarted and enlarged under its new constitution, has progressed steadily in the scope and utility of its work, and few, if any, enterprises have been undertaken in which Fletcher's personal activity could not be traced. Undoubtedly its policy has been swayed throughout by Fletcher's own early interest in the application of biochemical methods to scientific medicine, but this is to say that the Council has fostered both theoretical science and practical therapeutics in a fruitful way. Practical medicine has made great

advances lately in deficiency diseases, and the study of dietetics under the ægis of the Council form a good example of the sort of scientific investigation into the ætiology of disease which can be brought into relationship with treatment. The intervention of the Council to prevent the exploitation of insulin, a measure prompted personally by Fletcher, showed its readiness to take action where other than scientific interests might have influenced the distribution of a remedy needed by the world. The promotion by the Council recently of experiment and laboratory investigation in connexion with veterinary diseases is another example of its far-reaching work in which Fletcher was particularly interested. Briefly, a survey of the researches to which for the last ten years and more Fletcher gave close attention would show how wide was the range of his interests and how well he could estimate the difficulties arising in the solution of diverse problems. And in all this varied programme we find the principal executive officer working in close touch with the changing membership of his authority, which is a point to be emphasised. The responsibility of the Council towards the country remains the same, and the duty of the chief servant to the Council remains the same, but the personnel of the Council changes. How far should the executive officer change? Fletcher was able to answer the question. He was able to show an honourable adaptability. He did not pose at the Council as a "know-all," where the detailed work of our leading investigators was concerned, but to all those specialists he could supply general advice, assist them with general rules for obtaining accurate results, and for applying those general rules to the testing of new claims. He had many enthusiasms but they were under control; he had many personal friendships but he subordinated them to his duties; he made enemies of course—no one in such a post as his could avoid this—but many one-time adversaries became supporters, and not infrequently close friends.

The number of official duties which were discharged by Fletcher at different times are a testimony to the high opinion placed upon his services by all kinds of public bodies; they display a general acknowledgment of his grasp of scientific principles and of administrative machinery, of his ability to direct, and of his reasonableness in counsel. He was not of those who are ready to turn down the new because safety may lie in inaction, nor did his enthusiasm for progress lead him hastily into the advocacy of promising theories. He was generous but discriminating, as those who sat with him on various committees found. He was a member of the Army Pathology and Air Force Medical Advisory Committees, of the Pensions Ministry Disability Committee, and of the Health Advisory Committee set up in connexion with the Mines Department; he was medical assessor of the University Grants Committee, and a member of the last Royal Commission which sat to inquire into the constitution of the universities of Oxford and Cambridge. And he did valuable service in India during three strenuous months which he spent in that country, assisting to help the Government of India and the Indian Research Fund Association to organise the support of medical research and bring it to bear in many directions where investigation would amply repay any time and trouble spent. For this work he obtained in 1929 the C.B.

Fletcher received many academic distinctions; he was, for instance, an honorary D.Sc. Oxf. and an LL.D. of the universities of Glasgow and Edinburgh. He was a popular member of important social clubs; he had a long list of friends, with some of whom he travelled, fished, and shot. But none of the varied interests of his life ever caused him to lose his love of Cambridge and Trinity College. True it is 20 years since he exchanged the life of the don for that of the civil servant, but for the preceding 20 years he had lived in Cambridge, and represented her in thought and scholarship and play. Affection for Cambridge had become part of him, and his pleasure in his son's selection for the University boat was very real.

Sir Walter Fletcher married in 1904 Mary Frances, daughter of the late Charles James Cropper, of Kendal, and is survived by his widow and two children: a daughter and a son who is following in his father's footsteps at Cambridge, as scholar of Trinity and athlete.

A TRIBUTE FROM SIR HENRY DALE

"Many will have pondered during the past few days on all that medical research in this country, and far indeed beyond it, has gained from the chance which 19 years ago brought the man and the opportunity together. Walter Fletcher had then already left a permanent impress on physiology in particular, not only by the earlier research on record in his own name, but even more by his inspiring term of office as a tutor of Trinity. At the end of that period he might, still in the full vigour of early middle life, have returned to personal research at the laboratory bench. Had he done so, there can be no doubt that he would have produced further work of great distinction in the field of his choice; for he certainly had most of the qualities of the great investigator—a vigorous and logical mind, a quick imagination, prompt to see new possibilities of causal relation, an exacting standard of precision in action and thought, and a tireless curiosity. But it cannot be doubted that he made a greater and more permanent gift to science, and to medical science in particular, by devoting the remainder of his life to providing opportunity for research to be carried out by others. To this task he brought a first-hand knowledge of the meaning and needs of research, in rare alliance with a personality of remarkable charm and distinction, and with a natural gift for the handling of men and affairs. Without Fletcher as its secretary the Medical Research Fund would, no doubt, have been faithfully administered to provide helpful subventions for the researches of many and full-time opportunity for a chosen few. No committee, however, with a merely administrative secretary could have made it the transforming influence in medical research which it became. It may be doubted whether, under such conditions, it would have moved from its original relation to the National Insurance Scheme, or have grown beyond its original dimensions.

"Having accepted the opportunity, Fletcher became far more than the executive officer, administering the Fund in accordance with the Committee's and later the Council's decisions. From the first his administration was carried out on extraordinarily personal lines. He became the friend and counsellor of every worker whose researches the Fund could help and, as time went on, of many others who needed no such aid. His eager mind was always seeking new directions, in which material difficulties could be removed from some already promising line of investigation or in which some new quest could be stimulated by an offer of support. Men came from centres of research all over the country, not merely to enlist his interest with a view to financial

support but to submit new ideas to his keen and critical judgment, to take his advice on matters of planning and administration, or to seek his help and sympathy in personal difficulties. An analysis of the calendar of appointments in his office would surely exhibit an amazing variety of obligations cheerfully accepted. The fame of his ability and his wisdom went round the world. It was natural that the Indian Government should invite him to preside over its Commission of Enquiry on Medical Research. His name was as familiar to those concerned with the organisation of support to medical research in the United States of America, as in the the British Overseas Dominions. At home his influence spread far beyond the limits of the strictly medical field, and was effective at numerous points where Government action made contact with the applied biological sciences.

"Fletcher had a large circle of devoted friends, and the range of his personal contacts was wide and influential. Probably no man's advice was so widely sought as to the best method of applying funds which had been left in trust or which it was intended to give for the support of research. I do not think that there was any case in which he used such opportunity to bring additional funds under the direct control of the Council and of his own administration; it was other institutions rather—the Royal Society, the universities and hospitals—which on such occasions received the powerful aid of his advocacy. Such funds as came to the Council from outside benefactors came unsought, attracted by the reputation for enlightened administration which Fletcher's work had done so much to establish. For the position and the rights of the Council, on the other hand, he could be forceful and insistent to a length which some mistook for arrogance till they came to know the generous heart of the man, and to realise that he was fighting for what to him was a sacred cause and not for a moment for his personal position or prestige.

"The cause was that of research and of the genuine research workers. How often have I heard him, with obvious sincerity, depreciate his own activities, in comparison with those of the men and women who were engaged in the work of directly adding to knowledge! With his position of growing influence and distinction, with all the calls on his attention of large and important schemes, he always had time to spare for the humblest genuine research worker and kindly encouragement to give. He was at his best and happiest in friendly interchange with bright and eager young minds; and to any with a story to tell of new observations made or of new ideas yet to be brought to the test of experiment he was always ready to give the true encouragement of a really critical interest. No perfunctory compliments from Fletcher; you had to make clear to his quick impatience exactly what you were doing and why you were doing just that, and why the suggestions which darted from his alert intelligence were not appropriate. And then came the reward of his boyish pleasure and his insistence on the importance of the work and his eagerness to help its progress. To every worker in medical research he was a friend and a champion." H. H. D.

Miss Harriette Chick, D.Sc., writes: "A characteristic feature of Sir Walter Fletcher's administration of the activities of the Medical Research Council has been the sympathy and understanding offered to the individual worker along with the material support for the work. Writing as one engaged in work supported largely by the Council, and carried on for long periods under conditions of some difficulty in a foreign country, I look back with more gratitude than can be easily expressed to the encouragement which my colleagues and I received from Sir Walter Fletcher's attitude towards the research and its problems. While enjoying the advantages of complete freedom, we were conscious, in our relation to the Council, of an atmosphere in which all unnecessary criticism was withheld and loyal support and encouragement were predominant. His sensitive kindliness often anticipated our wants and we were able to work in the peaceful assurance that success or failure would alike be received with generous appreciation."

GEORGE DAVID STEWART, M.D. Bellevue

WE regret to record the death of Prof. G. D. Stewart, the well-known American surgeon, who held the chair in his subject at the Bellevue Medical College, New York. Prof. Stewart was an extremely interesting man. He was a Novoscotian and was born in 1862. Following much tradition in strenuous lives, he ran away to sea at the age of 14. Soon tiring of the adventure he went back to school, obtained a degree in theology in a Canadian college, served as the principal of a village high school, and had thoughts of entering the church. Various private circumstances changed his plans and enlarged his opportunities, when he decided to enter the medical profession. Accordingly he graduated in medicine from Bellevue in 1889, where it was his good fortune to serve under the elder Thayer and Joseph Bryant. He rapidly made a name as a surgical demonstrator and operator, and succeeded Bryant as professor of surgery at Bellevue. He proved himself a great lecturer as well as a fine practical surgeon, and in 1928, when he was elected president of the newly formed American College of Surgeons, he was a generally accepted leader of the profession. Prof. Stewart's genuine gift for friendship and his open-handed hospitality in New York City and on Long Island will be remembered by many of his English colleagues.

NORTH PERSIAN FORCES MEMORIAL MEDAL FOR 1932. This medal has been awarded to Dr. H. J. O'D. Burke-Gaffney, Colonial Medical Service, for his paper on the Classification of the Colon Aerogenes group of Bacteria in relation to their habitat and its application to the sanitary examination of water-supplies in the Tropics and in Temperate Climates, published in the *Journal of Hygiene* of January, 1932. The North Persian Forces Memorial Medal is awarded annually for the best paper on tropical medicine or hygiene published in any journal during the preceding 12 months by a medical officer, of under 12 years' service, of the Royal Navy, Royal Army Medical Corps, Royal Air Force, Indian Medical Service, or of the Colonial Medical Service, provided that the Memorial Committee consider that a standard of merit is reached justifying an award.

DARLING FOUNDATION PRIZE.—A Foundation was created by the Health Organisation of the League of Nations in honour of the late Dr. Samuel T. Darling, who met his death in 1925 by an accident while conducting a mission on behalf of the League. The purpose of this Foundation is the periodical award of a prize, known as the Darling Foundation Prize, to the author of an original work on the pathology, ætiology, and prophylaxis of malaria. It is announced from Geneva that the first award of the Foundation will take place on Jan. 1st, 1934, and that the Foundation Committee, on the recommendation of the Malaria Commission of the Health Organisation of the League, decided at a meeting held in Paris on April 29th, 1933, to award the prize to Lieut.-Colonel S. P. James, M.D., F.R.S.

MEDICAL NEWS

University of Oxford

In a congregation held on June 3rd the degree of D.M. was conferred upon Frank Hawkins.

The following have been elected as ordinary members of the Board of the Faculty of Medicine: J. G. Priestley, D.M.; P. N. B. Odgers, M.Ch.; and H. A. B. Whitelocke, M.Ch., for two years; and F. G. Hobson, D.M., for one year. The following have been elected as members of the Board of the Faculty of Medicine by the General Medical Electorate: H. S. Souttar, M.Ch., and O. L. V. S. de Wesselow, D.M.

Royal College of Surgeons of England

A meeting of the Council was held on June 8th, with Sir Holburt Waring, the president, in the chair. Sir Arthur Keith was reappointed master of the Buckston Browne research farm for the ensuing year. Mr. R. H. Burne was reappointed acting conservator of the museum, and Mr. T. W. P. Lawrence acting pathological curator. Mr. W. Sampson Handley was appointed the representative of the College on the Court of Governors of the University of Sheffield.

Diplomas of Fellowship were granted to the following candidates who were successful at the recent examination:—

Lambert Charles Rogers, L.R.C.P., Middlesex; Dwarka Prasad Bhargava, M.B. Allahabad, London and St. Bart.'s; James Jemson, L.R.C.P., Guy's; Eng Khway Seah, L.R.C.P., King's Coll.; Francis Selby Tait, M.B. Birm.; Libero Fatti, M.B. Lond., Univ. Coll.; John Andrew Kerr, L.R.C.P., Birm. and St. Bart.'s; William Leslie, M.B. Lond., Guy's and Lond.; George William Black, M.B. Lond., Middlesex; Francis Ward Allinson, M.B. Lond., Univ. Coll.; Ernest Arnold Hodgson Hindhaugh, M.B. Lond., Durh. and Lond.; John Edward Semple, M.D. Camb., St. Thomas's; Kenneth Leslie James, M.B. Lond., Univ. Coll.; Arthur John Craig Latchmore, M.B. Lond., Leeds; John Mortimer Leggate, M.B. Liverp., Liverp. and St. Bart.'s; Jocelyn Adelaide Medway Moore, M.B. Lond., Royal Free; Maurice James Bennett-Jones, M.B. Liverp.; Edward Alexander Butterworth, M.B. Lond., St. Mary's; Shavax Nasarvanji Mistri, M.B. Bombay, Lond.; Douglas Stanley-Jones, M.B. Lond., St. Bart.'s; Geoffrey Hirst Bateman, B.M. Oxf., King's Coll.; Arthur Lister, L.R.C.P., Camb. and Lond.; Christopher John Lester Thurgar, M.B. Lond., Univ. Coll.; William Derrick Coltart, M.B. Lond., St. Bart.'s; John Harold Peel, B.M. Oxf., Oxford and King's Coll.; Alan Ruscoe Clarke, M.B. Lond., Guy's; Vedamanickam Samuel John, M.B. Rangoon, Guy's; Harold William Rodgers, L.R.C.P., St. Bart.'s; John Eugene Anthony O'Connell, M.B. Lond., St. Bart.'s; Natverlal Bhogilal Fadia, M.B. Bombay, St. Bart.'s; Anappa Vithal Baliga, L.R.C.P., Bombay and Lond.; Archibald John Grace, B.M. Oxf., Saskatchewan and Guy's; Beharilal Kapur, M.B. Punjab, Lond. and St. Bart.'s; Herbert Frank McNickle, M.B. N.Z., Otago; George Lionel Alexander, M.B. Edin.; Henry Campbell Barrett, M.B. N.Z., Otago and St. Bart.'s; Jack Hesketh Beasley, M.B. Toronto, Toronto and Lond.; George Young Feggetter, M.B. Durh.; Ralph Richard Fitzgerald, M.D. McGill, McGill and Lond.; Henry Manners Hill, M.B. Melb., Melb. and St. Bart.'s; Robert James Wherry Malcolm, M.B. Sydney; Krishnalal Ghelabhai Munsif, M.B. Bombay, St. Bart.'s and Lond.; and Norman Henry Robinson, M.D. Melb., and John Burstall Turner, M.D. Melb., Melb. and St. Bart.'s.

The following were elected examiners for the ensuing year:—

Dental Surgery.—Surgical section: Mr. Russell J. Howard, Mr. Gwynne E. O. Williams, Mr. C. E. Shattock, Mr. C. P. G. Wakeley, Mr. P. H. Mitchiner, and Mr. E. G. Slesinger.

Primary Fellowship.—Anatomy: Prof. William Wright, Prof. J. E. S. Frazer, Mr. J. Basil Hume, and Mr. Grant Massie. Physiology: Prof. John Mellanby, Prof. G. A. Buckmaster, Dr. D. H. de Souza, and Prof. Samson Wright.

Diplomas of L.R.C.P., M.R.C.S.—Elementary Biology: Mr. T. J. Evans, Mr. G. P. Mudge, Mr. C. C. Hentschel, and Mr. A. J. Grove. Anatomy: Prof. W. E. Le Gros Clark, Prof. H. A. Harris, and Mr. E. P. Stibbe. Physiology: Prof. Hamilton Hartridge and Dr. A. St. G. J. McC. Huggett. Midwifery: Mr. Aleck W. Bourne, Mr. Sidney Forsdike, Mr. L. Carnac Rivett, and Mr. Malcolm Donaldson. Pathology: Mr. C. H. Fagge, Mr. C. E. Shattock, Dr. R. G. Canti, and Prof. James McIntosh.

Diploma in Public Health.—Part I.: Prof. J. W. H. Eyre. Part II.: Dr. James Fenton.

Diploma in Tropical Medicine and Hygiene.—Major-General D. S. Harvey and Dr. G. Carmichael Low.

Diploma in Ophthalmic Medicine and Surgery.—Part I.: Sir W. Stewart Duke-Elder and Mr. Charles B. Goulden. Part II.: Mr. R. Foster Moore.

Diploma in Psychological Medicine.—Dr. J. G. Greenfield.

Diploma in Laryngology and Otology.—Part I.: Mr. E. Musgrave Woodman and Mr. Sydney R. Scott. Part II.: Mr. W. G. Howarth.

Diploma in Gynæcology and Obstetrics.—Mr. J. D. Barris.

Diploma in Medical Radiology.—Part I.: Prof. J. M. Woodburn Morison. Part II.: Dr. J. H. D. Webster.

A Diploma of Membership was granted to P. N. Cutner (Edinburgh).

A portrait of the late Sir Robert Jones, presented by Sir Arthur Probyn Jones and Mrs. Frederick Watson, was accepted with the thanks of the Council.

University of Cambridge

On June 9th the following degrees were conferred:—

M.D.—L. P. Garrod and L. R. Shore.

M.B., B.Chir.—T. D. G. Wilson, J. H. Spence, W. R. Winterton, C. C. Bryson, J. L. Wild.

M.B.—P. McI. Smyth.

On June 8th, in the absence of Mr. Stanley Baldwin, the Chancellor, Mr. Will Spens, Vice-Chancellor, conferred the honorary degrees. Among those honoured was Sir Gowland Hopkins, professor of biochemistry in the University of Cambridge. The orator spoke of Sir Gowland's immense contribution to the health and happiness of mankind in the discovery of vitamins.

University of London

At a meeting of the Court held on June 7th, the chairman Lord Macmillan, presiding, it was announced that the following grants had been received from city companies payment in each case being spread over a period of years: the Merchant Taylors' Company, £5000; the Stationers' Company, £100. These benefactions will be applied towards meeting the cost of the new Ceremonial Hall to be erected in Bloomsbury. The Court also welcomed a grant of £100 from the Guardian Assurance Company towards the cost of the new buildings.

University of Birmingham

Dr. Oscar Brenner has been appointed to be assistant in forensic medicine and toxicology; Dr. A. V. Neale part-time demonstrator in practical pathology; and Dr. Margaret Thorpe to be part-time demonstrator in physiology. The Walter Myers travelling studentship has been awarded to Dr. E. J. Kerr to carry out research in Vienna.

University of Sheffield

Dr. L. C. D. Hermitte has been appointed demonstrator in pathology, and Dr. Eric James junior assistant bacteriologist.

It is announced that Prof. Edward Mellanby has resigned from the chair of pharmacology in this university following on his appointment to the Sheild chair of pharmacology in the University of Cambridge.

Society for the Study of Inebriety

A meeting of this society will be held in the rooms of the Medical Society of London, 11, Chandos-street, W., on Tuesday, July 11th, at 4 P.M., when Dr. J. D. Rolleston will read a paper on Alcoholism in Mediæval England.

Hunterian Society

This society offers a gold medal for competition amongst general practitioners of Great Britain, Ireland, and the Channel Islands. The award will be made in 1934 for essays on any subject chosen by the candidate received not later than Dec. 31st, 1933. The rules governing the award may be obtained from the hon. secretary, Mr. Andrew McAllister at 79, Wimpole-street, London, W. 1.

Conference for Hospital Librarians

An informal conference at St. George's Hospital on May 18th was well attended by voluntary librarians. Discussions were opened by Mrs. R. Beddington (Middlesex Hospital) and Mrs. Bruce Richmond (Guy's Hospital), and an address was given by Dr. Dobbie. The meeting was held under the auspices of the British Red Cross Society and Order of St. John Hospital Library. A unanimous decision was taken to establish an association for hospital librarians.

Fellowship of Medicine and Post-Graduate Medical Association

The third of a series of four lectures for advanced post-graduates will be given at the Medical Society of London, Chandos-street, Cavendish-square, W., on Wednesday, June 21st, at 5 P.M. Mr. F. J. McCann will give a lecture on the Repair of Injuries to the Perineum and Vaginal Walls. On Monday, June 26th, at the Medical Society of London, at 8.30 P.M., Dr. Roland T. de Hellebranthe, of New Jersey, U.S.A., will deliver a lecture on Modern Methods of Local and Spinal Anæsthesia. There will be a week-end course in general medicine and surgery at the General Hospital, Southend-on-Sea, on July 8th and 9th. On Friday, June 23rd, at 5 P.M., there will be an antenatal demonstration at the Royal Free Hospital, Gray's Inn-road, London, W.C. On Tuesday, June 27th, at 8.30 P.M., at the West End Hospital for Nervous Diseases (In-patient Department), Mr. Lindsay Rea will give a demonstration on the fundus oculi. On July 13th, at 4–6 P.M., at the Medical Society of London, Dr. Peter Kerley will give a demonstration of X ray films of the chest and heart and intestinal tract.

King Edward VII.'s Convalescent Home for Officers, Osborne

The following have been appointed to the civil consulting staff: Sir Cuthbert Wallace, Prof. G. E. Gask, Mr. E. Rock Carling, Mr. W. Rowley Bristow, Mr. Claude H. S. Frankau, Sir William Willcox, Prof. F. R. Fraser, and Dr. Gordon Holmes.

People's League of Health

In view of the contribution made by representatives of veterinary practice to the League's investigation into the relation of tuberculosis to the milk-supply, which emphasised the close association existing between the diseases of animals and the public health, a veterinary council has been added to the administration of the League, and the following have agreed to serve: Lieut.-Colonel J. W. Brittlebank, Profs. J. B. Buxton and S. H. Baiger, Mr. Arthur Gofton, Sir Frederick Hobday, Mr. G. P. Male, Mr. F. C. Minett, D.Sc., Major-General Sir John Moore, Major D. S. Rabagliati, Major Brennan de Vine, and Prof. G. H. Wooldridge.

The Leishman Prize for 1932

This prize has been awarded to Major H. J. Bensted, R.A.M.C., for the year 1932, consisting of a silver medal and a sum of £30, for his work in the interests of military pathology. The Leishman Prize (officers) is awarded annually for the best piece of work in any branch of medicine, surgery, or the allied sciences, or in connexion with the general duties of the Royal Army Medical Corps, by an officer of this Corps, or the Army Dental Corps, or by an officer removed from either of these Corps but still on the active list.

Medical Conference on Contraception

A conference will be held in the Great Hall, B.M.A. House, Tavistock-square, London, W.C.1, on July 8th. In the morning Mr. C. W. Bellerby will speak on Recent Researches on Temporary Hormonic Sterilisation, Prof. Julian Huxley presiding; and Mrs. L. M. Jeffreys, M.D., Mrs. F. Ivens-Knowles, M.S., and Dr. A. G. M. Severn will speak on Public Health Authorities and Information on Contraception, Dr. Helena Wright presiding. Lord Horder will take the chair at the afternoon sessions when Mr. John Baker, Ph.D., and Mr. H. M. Carleton, Ph.D., will speak on Chemical Spermicides and their Effects, and Dr. E. F. Griffith on General Practice and Information on Contraception. Further information may be obtained from the secretary, the National Birth Control Association, 26, Eccleston-street, London, S.W.1.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, June 20th.—5.30 P.M., GENERAL MEETING OF FELLOWS.
FRIDAY.—8 P.M., EPIDEMIOLOGY AND STATE MEDICINE. Dr. William Butler: Epidemiology and State Medicine. (Presidential address.)

EUGENICS SOCIETY.
TUESDAY, June 20th.—5.30 P.M. (at Burlington House, Piccadilly, London, W.), Dr. K. B. Aikman: Race Mixture.

MEDICO-LEGAL SOCIETY.
THURSDAY, June 22nd.—8 P.M. (at 11, Chandos-street, Cavendish-square, London, W.), Annual General Meeting. Mr. Albert Crew: Some Functions and Duties of a Medical Practitioner in Criminal Courts.

RESEARCH DEFENCE SOCIETY
THURSDAY, June 22nd.—3 P.M. (at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C.), Major-General Sir Leonard Rogers: The Saving in Life and Suffering due to Medical and Veterinary Research, with special reference to the Tropics.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, June 19th, to SATURDAY, June 24th.—MEDICAL SOCIETY OF LONDON, Chandos-street, Cavendish-square. Wed., 5 P.M., Dr. F. J. McCann: The Repair of Injuries to the Perineum and Vaginal Walls. (Illustrated by the epidiascope.)—CITY OF LONDON HOSPITAL, Victoria Park, E. All-day Post-graduate Course in Diseases of the Chest.—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. Antenatal Treatment, Frid., 5 P.M.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, June 19th.—10 A.M., Medical Wards. 11 A.M., Surgical Wards. 1.30 P.M., Gynæcological Wards. 2 P.M., Medical, Surgical, Eye, and Gynæcological Clinics.
TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Wards. 2 P.M., Medical, Surgical, and Throat Clinics. 4.15 P.M., Mr. Green-Armytage: Prolapse.
WEDNESDAY.—10 A.M., Medical and Children's Wards. Children's Clinic. 2 P.M., Medical, Surgical, and Eye Clinics.
THURSDAY.—10 A.M., Neurological Clinic. 11 A.M., Fracture Clinic. 2 P.M., Medical, Surgical, Eye, and Genito-urinary Clinics. 4.15 P.M., Mr. Steadman: Pyorrhœa.
FRIDAY.—10 A.M., Skin Clinic. 12 noon, Lecture on Treatment. 2 P.M., Medical, Surgical, and Throat Clinics.
SATURDAY.—10 A.M., Medical and Surgical Wards, Children's and Surgical Clinics.
Operations daily at 2 P.M. The lectures at 4.15 P.M. are open to all medical practitioners without fee.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION St. James's Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, June 21st.—2.30 P.M., Visit to H.M. Borstal Institution, Borstal, Rochester.

ST. PETER'S HOSPITAL FOR STONE, Henrietta-street, W.C.
WEDNESDAY, June 21st.—3 P.M., Dr. Cuthbert Dukes: The Pathology of Tumours of the Kidney and Bladder.

NATIONAL HOSPITAL, Queen-square, W.C.
TUESDAY, June 20th.—6 P.M., Dr. Martin: System Diseases of the Spinal Cord.
THURSDAY.—6 P.M., Dr. Carmichael: Cerebral Vascular Disease.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, June 22nd.—4.30 P.M., Mr. C. N. Morgan: Prolapse of the Rectum.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, June 21st.—4.30 P.M., Dr. G. R. M. Cordiner: The Rôle of Radiology in the Diagnosis of Urinary Calculus.

ST. BARTHOLOMEW'S HOSPITAL MEDICAL COLLEGE, E.C.
FRIDAY, June 23rd.—10–10.45 A.M., Dr. G. Evans: Diet in Dyspepsia, Gastric and Intestinal. 11–11.45 A.M., Dr. G. Bourne: Heart Attacks. 12–12.45 P.M., Dr. A. E. Gow: Neuritis, Fibrositis, and Rheumatism. 1.45–2.30 P.M., Dr. A. C. Roxburgh: Skin Diseases—Diagnosis and Treatment with Cases. 2.45–3.30 P.M., Mr. R. Foster Moore: Common Conditions of Eye with Cases. 4–4.45 P.M., Mr. S. L. Higgs: Painful Feet.
SATURDAY.—10–10.45 A.M., Prof. F. R. Fraser: Toxic Goitre. 11–11.45 A.M., Mr. J. B. Hume and Dr. N. S. Finzi: Toxic Goitre. 12–12.45 P.M., Dr. F. G. Chandler: Artificial Pneumothorax. 1.45–2.30 P.M., Dr. W. Shaw: Functional Dysmenorrhœa. 2.45–3.30 P.M., Mr. John Beattie: Labour—its Management with special reference to Anæsthesia and Analgesia. 4–4.45 P.M., Mr. J. P. Hosford: Common Fractures of Lower Limb.

ROYAL SANITARY INSTITUTE.
SATURDAY, June 17th–24th.—Congress at Blackpool.

INSTITUTE OF MEDICAL PSYCHOLOGY, 6, Torrington-place, W.C.
MONDAY, June 19th, to SATURDAY.—Course on Approach to the Psychoneuroses. (Second week.)

Births, Marriages, and Deaths

BIRTHS

GOODING.—On June 1st, at "Dhoonglen," Ditton-road, Surbiton, Surrey, the wife of Stanley Gooding, M.D., of a son.
INNES.—On June 9th, at Plymouth, the wife of L. Walrond Innes, F.R.C.S., of a daughter.
RICHARDSON.—On June 9th, the wife of Dr. P. L. Richardson, Tunbridge Wells, of a daughter.
RICHMOND.—On May 31st, at a nursing home in Tavistock, the wife of Dr. R. G. E. Richmond, of Princetown, Devon, of a son.
ROBINSON.—On June 5th, at Parklands, Surbiton, the wife of R. D. Robinson, M.B., B.S., of Richmond-road, Kingston, of a daughter.

MARRIAGES

COLES—TEMPLETON.—On June 7th, at Christ Church, Woburn-square, W.C.1, Richard A. Coles, M.B., C.M., of The Corner, Hoggeston, Bucks, to Edith Minnie, second daughter of the late Major J. P. Templeton (Lincolnshire Regiment).
PRICE—CLARK.—On June 1st, at the Memorial Chapel, The University, Glasgow, Roy Kemball Price, M.D., M.R.C.P., to Mary Campbell Clark, M.B., Ch.B., eldest daughter of Rev. J. G. and Mrs. Clark, Hill-street, Glasgow.
WELPLY—DAVIES.—On June 1st, at St. Erfyl's Church, Llanerfyl, Montgomeryshire, Gilman Chinnery Welply, M.R.C.S., L.R.C.P., to Aline Rowena, only daughter of the late Mr. Hugh Davies, F.R.C.S., and Mrs. Hugh Davies, of Bryntanat, Llanerfyl, Montgomeryshire.

DEATHS

BUTLER.—On June 5th, in London, William John Butler, M.R.C.S., L.R.C.P., Indian Medical Service (retd.), in his 88th year.
FLETCHER.—On June 7th, after an operation, Sir Walter Morley Fletcher, K.B.E., C.B., Sc.D., M.D., F.R.S., of Holland-street, Kensington, W., aged 59.
GREIG.—On June 6th, at Gordon-road, Ealing, Charles John Greig, L.R.C.P. & S. Edin., L.R.F.P.S. Glasg.
RICHARDS.—On June 7th, suddenly, at Old Manor House, Bridge of Allan, Dr. Charles Basil Richards.
SCUDAMORE.—On June 11th, Dr. C. G. C. Scudamore, L.R.C.P., &c., of Whitehorse-road, Croydon, aged 71.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE DOCTOR'S CONTROL IN A STATE MEDICAL SERVICE

In his presidential address to the Socialist Medical Association on May 21st Mr. Somerville Hastings considered to what extent the voice of doctors should be heard in the administration and development of a socialist medical service. The real success of such a service must, he said, depend to a large extent on the attitude of mind of the men and women who are working it; unless they are free from any sense of grievance they cannot be expected to do their utmost to make the service a success. For many years past the State and the local authorities had been undertaking the supply of the medical and public health needs of the populace, and an increasing number of doctors had become whole- or part-time government servants. To what extent ought they, in the public interest, to have a controlling voice in the services they were helping to administer. Consideration of this question has been forced upon the medical profession, especially of late by the dispute, now apparently amicably settled, between the London County Council and the British Medical Association. This dispute was ostensibly about the salaries, hours, and conditions of service of consultants under the L.C.C., but in reality there was a deeper issue involved and the Association felt not only that it ought to have been consulted about conditions of service before the appointments were advertised, but that it ought to have had some voice in the selection of the consultants who were appointed.

What administrative control, Mr. Hastings asked, had the medical profession already in these services. The medical officer of health of the L.C.C. was, he said, directly responsible not only for the public health, hospital, and ambulance services, but for the school medical service as well, although he delegated a good deal of this work to his principal medical officers. Much of the actual work of the L.C.C. in connexion with the alteration and improvement of the public health and medical services was carried out by departmental committees, composed of medical officers of the hospitals and other services who issued reports to the medical officer of health, which he passed on—with any modifications he thought necessary—to the public health committee. Associations of medical superintendents of the L.C.C. general and special hospitals met at regular intervals and submitted any proposals they might think fit to the medical officer. The junior medical staff also had their associations. The system seemed to work well in practice, but it had this objection—at any rate on theoretical grounds—that the only official communication between the medical staff and the L.C.C. was through a very narrow bottle-neck (if he might put it so) the medical officer of health. Information from officers of the L.C.C. might reach the members unofficially in other ways, but the only official means of communication was through the M.O.H.

Amongst the voluntary hospitals the most diverse conditions were to be found. Some of the smaller voluntary hospitals, in provincial towns especially, were to all intents and purposes completely controlled by the medical staff. On the other hand, in some of the larger hospitals of the metropolis and elsewhere, the honorary staff had no control whatever. In some they had representatives on the committee of management, but in others there was no one to put before this committee the case for any recommendations that the medical staff might submit to it. Some few years ago, he said, a senior surgeon of a large London voluntary hospital was asked to resign; his colleagues protested, but were told politely by the board of management that if they raised any objection they would also be discharged.

FOUR GUIDING PRINCIPLES

Mr. Hastings then enunciated some of the guiding principles in determining the amount of control to be given to the workers in a State medical service. He said:—

"(1) I think the medical staff must have the sole determining voice as to the type of medical treatment to be given to each individual patient. The relation between doctor and patient is of a most intimate nature, and it must always be the duty of the doctor to do his very best to ensure the earliest and most complete recovery in cases of injury or disease. This does not, of course, mean that a senior may not recommend to a junior the carrying out of some special line of treatment; nor does it preclude the working together of doctors as a team.

"(2) The public authority employing a medical officer must have the sole voice in his appointment. There can be no reason why a body representative of the profession—a doctors' union in fact—should not keep careful watch on salaries, hours, and other conditions of employment, and consult with the public body responsible. Under certain conditions doctors employed by that body, or even those outside, may advise about the qualifications of candidates, but the actual selection of applicants must always be made by the public body that employs.

"(3) The doctors themselves or their representatives must always have direct access to those who are administering the medical service, so as to be able to report difficulties and grievances when they arise. While this may take place in ordinary cases through an official, it must always be possible for the medical personnel to come into direct contact with the public representatives if they so desire.

"(4) The medical personnel of a service must have power to tender advice as to its development to the public representatives responsible for that service. As to the machinery of approach there may be room for difference of opinion. Some may think that representatives of doctors in a service should sit on the controlling committee in an advisory capacity. My own view is that it is better for the organisation representing the doctors, or for the doctors themselves, to report to the committee by means of memoranda or deputations on matters for special consideration. The point I feel strongly about is that by some channel or other they should have the power of direct communication."

MISTLETOE FOR CANCER

We have received from a medical correspondent in England a typescript signed by Werner Kaelin (Clinical-Therapeutic Institute, Arlesheim, Basle), describing in English the viscum treatment of carcinoma and of precancerous conditions and their early diagnosis by means of the capillary-dynamic reaction method. The script relates that 15 years ago Dr. Rudolf Steiner suggested the treatment of carcinoma and of precancerous conditions by means of injections of various kinds of viscum; on the strength of these suggestions Dr. Ita Wegmann, of Arlesheim, prepared an injection which, after the dosage had been duly tested, produced encouraging results in patients suffering from carcinoma. Since then this therapy is said to have been developed uninterruptedly, the viscum preparations manufactured in accordance with the method being designated by the name Iscador. Four preparations are mentioned, each being made from a different kind of viscum; fir mistletoe is used for male patients, apple mistletoe for female patients, oak mistletoe for special cases in both sexes, pine mistletoe for prophylactic treatment. The rationale of the treatment, it is admitted, may be considered empirical by the chemico-physical outlook of the present day, but the fact that mistletoe possesses in high degree the power of storing magnesium is regarded as a valuable clue to an understanding of its properties. The second part of the script deals with a method of blood examination which has been worked out at

the Arlesheim institute, based on the capillary action of the blood with viscum as the reagent. Seventy-five per cent. of positive reactions are claimed for definite cases of carcinoma, and the results, we are told, confirm Dr. Steiner's impression that the tendency to carcinoma is primarily of psychic origin. For the further information of those into whose hands this script may come, we may add that Dr. Kaelin holds the Swiss federal diploma in medicine and is physician in charge of the hospital of Dr. Steiner's anthroposophical colony at Arlesheim. A medical correspondent in Switzerland tells us that while no one in his own country questions Dr. Kaelin's good faith he is not in close contact with medical thought and has not brought the results of his work before any Swiss medical society. The capillary-dynamic reaction has been subjected to test at the surgical clinic in Basle where it was found to bear some relation with the red cell sedimentation test but not to be specific for cancer. Mistletoe has been tried at the Basle clinic with the result that some of the patients said they felt better for it, possibly due to an effect on the blood pressure, although the course of the cancer was not affected. Dr. Kaelin makes free use of the term "precancerous condition" and often claims success in curing cancer before it is visible; but there is no reason to believe that patients do not die of cancer at Arlesheim as they do elsewhere—unless transferred to other hospitals. We learn of an advanced case of cancer of the breast in an English lady who had been treated for a considerable time at the clinic from which she was removed to die elsewhere. The patients at Dr. Kaelin's hospital are drawn from many countries; at present English and Americans predominate.

ARSENIC POISONING IN A MANGANESE FACTORY

Dr. Salmon and Dr. Planque [1] have lately given an account of an outbreak of arsenic poisoning which shows how difficult it may be to discover the true cause of chronic ailments among workers exposed to unknown hazards. The problem is apt to be complicated by the capacity of some workers to go scot-free from poisoning to which several of their companions react with text-book-like conformity. The story begins with a factory whose owner, in December, 1929, was authorised by the local authorities to run a factory for the crushing and drying of salts of manganese. In October, 1932, two local medical practitioners were independently consulted by several of the employees. One of them was a man, aged 26, who complained of pain in the head, abdomen, lumbar region, and lower limbs. He had much difficulty in walking, particularly downstairs. His speech was slow and monosyllabic, and his face was expressionless. The extensors of his legs were slightly atrophied, and his gait was stepping. The other was a man, aged 39, whose gait, expression, and difficulties of speech were the same as in the first case. Though unequal, the pupils reacted normally to light and to accommodation; tremor of the hands, almost complete loss of the patellar and Achilles reflexes, and pain in, and numbness of, the lower limbs were also observed. Two other cases presented similar features. In none of the four cases were there cutaneous manifestations, a positive Wassermann, cyanosis of the extremities, or hyperkeratosis of the palms of the hands or soles of the feet. A distinguished consultant, whose opinion was sought by one of the patients, hesitated between the alternatives of the sequels of lethargic encephalitis and disseminated sclerosis. He was, however, inadequately informed about the conditions under which the patient worked. Inspection of the factory showed that the workers employed indoors looked like blackamoors, so thick was the manganese dust on them. All the four patients were indoor workers, and none of the employees working in the open had shown any symptoms. On the other hand, one of those most exposed to the dust inside the factory had shown no sign of poisoning. An analysis of the powder handled in the factory showed it to contain over 81 per cent. of the oxides of manganese, and over 9 per cent. of silica. It also contained 0·013 per cent. of arsenic.

[1] Ann. d'hyg. pub. indust. et sociale, April, 1933

THE OLD MAN DIES [1]

WHEN, more than half-way through this absorbing novel, the old man dies, his descendants by two marriages number 15. It is a tribute to the author that the genealogical table supplied is unnecessary, for each member of the Rushbrooke family has been introduced to a reader already prepared, if not impatient, to meet these new acquaintances and their mates and playmates. Not that the skilful presentation of personnel is noticed at a first reading, any more than the social gifts of a hostess are manifest during a successful party. But when the excitement is over it is proper for a grateful guest at this family gathering to record appreciation of admission to such intimacy. The hero—the word is deliberate—is the middle-aged son of the founder of the business which supports all the Rushbrookes. Overshadowed by a terrific father, whose capacity for exacting service has outlived his power of inspiring affection, Tom Rushbrooke carries increasing burdens which none of his relatives is prepared to share. During a crucial phase of his monetary anxieties his favourite son, who has chosen a medical instead of the business career marked out for him, seeks his help in financing a research expedition with the object of discovering the combination of drugs used by a native tribe to abolish labour pains. It is characteristic of the sincerity of the book that even a medical reader catches the boy's enthusiasm, and shares his agony at the disaster which destroys the records when success seemed assured. But something grips the attention even more than the fate of this expedition, or even the dramatic tension of the reading of the old man's will, with its curious effect on the distribution of wealth in the family. It is the emotional reactions of its various members to such disturbances as an impending divorce, marriages contemplated for reasons deemed inadequate or improper, and liaisons overt or suspected. We commend this book chiefly for its quiet insistence on values that are not ephemeral.

[1] By Elizabeth Sprigge. London: William Heinemann, Ltd 1933. Pp. 292. 7s. 6d.

BCG OBSERVATIONS ON THE GUINEA-PIG

Dr. Konrad E. Birkhaug, who is associate professor of bacteriology at the Rochester University school of medicine, New York, and who is at present working at the Pasteur Institute in Paris, has published in Norwegian, in *Nordisk Medicinsk Tidskrift* for Jan. 28th, a summary of some of the observations he has made during the past three years on the guinea-pig's reaction to B C G. The first question he asked himself, and which he answers in the affirmative, is whether or not B C G yields a tuberculin as potent as that derived from virulent tubercle bacilli. His method of comparing the potency of tuberculins derived from various sources was by the intracutaneous injection of 0·1 c.cm. of a 5 per cent. solution of tuberculin into tuberculous rabbits. In another series of investigations he gave large doses of B C G by the mouth to new-born tuberculin-negative guinea-pigs. Six months later these ten guinea-pigs and an equal number of controls were given subcutaneous injection of virulent tubercle bacilli. There was very little difference in the tuberculous lesions developed by the guinea-pigs in the two groups; and Birkhaug expresses grave doubts as to the ability of B C G given by the mouth to effect any uniform immunising response. More impressive, however, was the immunity achieved by the intraperitoneal injection of B C G in guinea-pigs subsequently infected with virulent tubercle bacilli administered subcutaneously. For while the average duration of life of the B C G animals was 304 days, that

of the controls was only 189 days. Similar results were obtained when B C G was given subcutaneously and the guinea-pigs were subsequently exposed to an infection with virulent tubercle bacilli. When intradermal injections of B C G were given, the average survival of the B C G guinea-pigs was 417 days, as compared with only 189 days for the controls, also infected with virulent tubercle bacilli. In the light of these and various other investigations, Birkhaug comes to the conclusion that B C G is a harmless vaccine capable of effecting a lasting and considerable degree of immunity to tuberculosis, provided it is given by a parenteral route.

NEW PREPARATIONS

Messrs. Burroughs Wellcome and Co., Snow Hill Buildings, London, E.C., have added to their list the following three hypnotic products: TABLOID PHENOBARBITONE, gr. 1; TABLOID PHENOBARBITONE SOLUBLE, gr. 1; TABLOID BARBITONE SOLUBLE, grs. 5. These products are issued in bottles of 25 and 100. The two tabloid phenobarbitone products are designed specially for the treatment of epilepsy and aural vertigo, but are also helpful in insomnia and states of nervous excitement. Tabloid barbitone soluble is more rapid in action than ordinary barbitone, which is an effective hypnotic of the ureide series.

IVAGO DENTAL CREAM.—This preparation comes from the Ivago Laboratories (Paris), the distributing agents being Messrs. Coates and Cooper, Ltd., 94, Clerkenwell-road, London, E.C. The cream contains an active principle which has been employed in the treatment of pyorrhœa alveolaris. The preparation is pleasant to use, and the claim is made that regular use brings about immunisation of the buccal mucosa. The obstinacy of pyorrhœa is well known, and as this preparation contains nothing that can possibly do harm, and can claim certain successes, it deserves a trial.

Messrs. Allen and Hanburys Ltd., Lombard-street, London, E.C., have placed upon the market EUPARATONE, a parathyroid extract (Collip fraction), being a biologically standardised solution of the active fraction of parathyroid glands responsible for the mobilisation of calcium in the blood-serum. In hypoparathyroidism—e.g., infantile and post-operative tetany—it might prove valuable, and can also be used in such conditions as chronic ulcers or plumbism.

LIVRON (Boots Pure Drug Company, Ltd., Nottingham).—This is a compound liver extract with iron, each fluid ounce containing ext. hepaticæ equivalent to 2 oz. of fresh liver; ext. cerevisiæ equivalent to ½ oz. fresh yeast; ferr. et ammon. cit., grs. 90; ferr. et mangan. cit., gr. 1; ext. medullæ rub., ℥ 50; glycerin., ℥ 40; tinct. cardam. co., ℥ 60; glycyrrh. ammon., gr. 4/5; acid. salicyl., grs. 2; ext. malt. liq. ad 1 fl. oz. It may be necessary in cases where anæmia is present from diverse causes to supplement a liver dietary with iron, and this preparation can be used to supply an exact dosage of iron in an easily assimilated form. The conditions where it might be of particular use include anæmia following acute and chronic hæmorrhage, and following pregnancy. The dosage for adults is a tablespoonful twice daily, and for children two teaspoonfuls twice daily, smaller doses in each case being prescribed when a general tonic effect is required. The directions state also that Livron should be used under medical direction.

Appointments

McKENDRICK, W., M.B., Ch.B. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Blackwood District of Monmouth.

Queen Charlotte's Maternity Hospital: NEWLANDS, H. J., M.B., Ch.B. Edin., Senior Resident Medical Officer; YOUNG, J. S., M.B., Ch.B. Glasg., Assistant Resident Medical Officer; and LATTER, ROSALIND B., M.B., Ch.B., Resident Anæsthetist.

Vacancies

For further information refer to the advertisement columns

Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.

Ayr, Glengall Hospital for Mental Diseases.—Jun. Asst. M.O. £300.

Birmingham, Dudley-road Hospital.—Jun. M.O. At rate of £200.

Blackburn Royal Infirmary.—Fourth H.S. £150–£200.

Bristol Eye Hospital.—Asst. Res. H.S. At rate of £100.

Burnley, Victoria Hospital.—H.S. At rate of £150.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S. At rate of £120 and £100 respectively.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Asst. to Out-patient Department.

Charing Cross Hospital, W.C.—Hon. Clin. Asst. to Dermatological Dept.

Cheadle Royal Mental Hospital, Cheadle, Cheshire.—Clin. Asst. At rate of £150.

Chester Royal Infirmary.—H.S. £150.

Chesterfield, North Derbyshire Royal Hospital.—Cas. O. and H.S. At rate of £200 and £150 respectively.

Colchester, Essex County Hospital.—H.S. and H.P. At rate of £175 and £150 respectively.

Dreadnought Hospital, Greenwich, S.E.—H.P. At rate of £110.

Durham County Mental Hospital.—Asst. M.O. £350.

East Ham County Borough.—M.O.H. and School M.O. £1100.

Edmonton, North Middlesex County Hospital.—Res. Physician. £600.

Evelina Hospital for Sick Children, Southwark, S.E.—H.P. At rate of £120.

Gloucestershire Royal Infirmary, &c.—Two H.S.'s Each at rate of £150.

Hastings, Royal East Sussex Hospital.—Hon. Surg.

Hertford County Hospital.—H.S. At rate of £200.

Hospital for Sick Children, Great Ormond-street, W.C.—In-patient Med. Reg. £300. Two Out-patient Med. Regs. Each £250. Three Out-patient Anæsthetists. Each £50.

Huddersfield Royal Infirmary.—H.S. At rate of £150.

Liverpool City.—Asst. City Bacteriologist. £600.

Liverpool, Mill Road Infirmary.—Med. Supt. £1000.

London Hospital, E.—Surgical First Asst. and Registrar. £300.

London Lock Hospital and Home, Harrow-road, W.—Hon. Surg.

London University.—External Examinerships.

Manchester, Ancoats Hospital.—H.P. At rate of £100.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—H.P.'s and H.S.'s. At rate of £50. Also Two Res. Anæsthetists. Each £144.

Northampton General Hospital.—Hon. H.S. Also H.S. for Ear, Nose, and Throat Dept. At rate of £150.

Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.

Norwich, Norfolk and Norwich Hospital.—H.S. and H.P. Each £120.

Oldham Royal Infirmary.—H.S. At rate of £175.

Plymouth, South Devon and East Cornwall Hospital.—H.P. At rate of £120.

Preston and County of Lancaster Royal Infirmary.—H.S. Also Special H.S. Each at rate of £150. Also Res. Surg. O. At rate of £300.

Princess Beatrice Hospital, Richmond-road, Earl's Court, S.W.—Res. M.O. At rate of £110.

Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.S. At rate of £125.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, N. Kensington, W.—H.P. and H.S. Each at rate of £75.

Queen Mary's Hospital for the East End, E.—H.S. At rate of £120.

Queen's Hospital for Children, Hackney-road, E.—Clin. Asst. for Med. Out-patients.

Royal Army Medical Corps.—25 Permanent Commissions.

St. Albans, Herts, Hill End Hospital.—Asst. M.O. £350.

St. John's Hospital, Lewisham, S.E.—Res. H.S. At rate of £100.

St. Peter's Hospital for Stone, &c., Covent Garden, W.C.—Clin. Assts.

Shrewsbury, Royal Salop Infirmary.—Res. H.P. At rate of £160.

Southampton, Royal South Hants and Southampton Hospital.—Res. Surg. O. £200. Also H.P., and Res. Anæsthetist. Each at rate of £150.

Southend-on-Sea General Hospital.—Sen. Asst. Res. M.O. £150.

Torquay, Torbay Hospital.—H.P. £175.

University of London.—University Chair of Pathology. £1100.

West End Hospital for Nervous Diseases, Welbeck-street, W.—Hon. Asst. Ophthalmic Surgeon.

Willesden General Hospital, N.W.—Clinical Assts.

Windsor, King Edward VII. Hospital.—Two H.S.'s. Each at rate of £100.

Wolverhampton and Midland Counties Eye Infirmary.—H.S. £150.

Wolverhampton Royal Hospital.—H.S. At rate of £100.

Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—H.P. and H.S. Each at rate of £100.

Worcester County and City Hospital, Powick.—Asst. M.O. £350.

York County Hospital.—H.P. £150.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Kirton-in-Lindsey, Lincs, and March, Cambs.